Railway Age

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What Is "Unfair Competition?"

THERE is no point upon which leaders of "big business" in the United States are more completely agreed than upon the undesirability of unfair competition, but it is not always clear just what they mean by unfair competition. Everybody agrees that competition in reducing production costs, improving the quality of products, and using sales arguments to convince prospective customers that one's goods are the best on the market, or the best in proportion to the prices asked for them, is fair competition, and that fair competition is good for business. Is it fair competition, however, for the large purchases made or the large traffic given by a big company to be used as an argument for making purchases from it or some other company, rather than from some smaller company that has smaller purchases or traffic to offer?

This question apparently is to be passed upon by the Federal Trade Commission in a case which it has started for alleged unfair competition against the Mechanical Manufacturing Company and two officers of Swift & Company, the packers. The proceeding seems to be based principally upon a letter sent by Swift & Company to officers of railways throughout the country, which was published in the *Railway Age* of February 2, 1929. In this letter it was stated that "the Swift family owns the Mechanical Manufacturing Company," that "our people have decided to take on the Durable draft gear and the Durable centering device, and we expect our railroad friends to use these devices on a reciprocity basis, with the understanding that they are competitively priced and their quality is second to none." Only one interpretation of this letter, and especially of the words "reciprocity basis", seemed possible, and this was that Swift & Company were asking railways to make purchases from a company controlled by the Swift family, rather than from other companies competing with it in the manufacture and sale of railway supplies, largely because Swift & Company gave the railways more traffic.

Competition Between Large and Small Concerns

The Federal Trade Commission is the government body created to pass on the questions of what is fair competition. If this is fair competition it is evident that big business has a fair, but very great, advantage over little business in selling to railways that is due entirely to the volume of traffic that it controls. If it can be held to be fair competition it is plain that many other big concerns controlling large amounts of traffic would find it to their advantage to engage directly or indirectly in the manufacture and sale of railway equipment and supplies.

If it is unfair competition, government action to stop it may be desirable, but ought not to be necessary. Public sentiment is now much more favorable to big business than it formerly was. Business leaders have largely succeeded in convincing the public that there is no danger in mere size of business concerns, upon the grounds that the bigger a concern is the more economically it can produce, and the less likely it will be to use unfair competitive methods. Leaders of big business can best show the public they are sincere in what they say by acting accordingly. They oppose enforcement of the anti-trust law and other forms of government interference with business by claiming that government interference is not necessary to prevent small concerns from being crushed by misuse of the power that big concerns have merely because of their size. The public will not always believe this if the conduct of big business belies its professions.

The action of Swift & Company in broadcasting a letter soliciting purchases from the Mechanical Manufacturing Company was an unusually bold use of the "reciprocity" argument; but the use of traffic to influence purchasing by railways, and also other features of railway management, has become quite general. Whether this is unfair competition or not, it is a practice which is a menace to the welfare of the railroad industry. The net return earned by the railways as a whole depends principally upon the difference between total earnings and total operating expenses. Traffic and earnings are not growing as rapidly as formerly, and the mere diversion of traffic from one road to another does not increase the earnings of railways as a whole. Furthermore, it probably would be difficult for any railway to show that, over any considerable period, it actually has benefited by allowing its purchases to be influenced by traffic considerations, or by using its purchases to influence traffic. A shipper who is successful in using

his traffic to influence the purchases of one railway will try to use or actually use it to influence the purchases of others, and the more successful he is in using it effectively the less benefit each road will derive from allowing itself to be influenced by it.

Effects on Operating Expenses

The important question is as to the probable effects upon the operating expenses of the railroad industry. With passenger business declining and freight business growing less than formerly, the railways must rely more and more upon economies in operation to maintain or increase their net operating income. Nobody can claim that the influencing of purchases by traffic has any tendency whatever to reduce operating expenses. Its tendency must be to hinder operating economies, because a concern that must rely entirely upon quality, price and ordinary sales methods to sell its goods is almost certain to offer better prices in proportion to the quality of its goods than one which relies largely upon the amount of traffic it can give as a sales argument. Whatever tends to interfere with economies in operation must, in the long run, be contrary to the welfare of the railroad industry, and therefore of most of the railways that compose that industry.

Almost throughout the history of the railroad industry big shippers have been tempted, and often have yielded to the temptation, to use the power given them by the traffic they control to extort from the railways advantages over smaller competing shippers. To the effects of this use of their power is due much of the regulation to which the railways are subject. The law and decisions of the courts now clearly define and penalize unfair discrimination by railways in service or rates between shippers, the principal purpose being to prevent big shippers from being given an unfair competitive advantage over small shippers. If big shippers can dictate to railways regarding their purchases by offering them traffic or threatening to divert it from them, they can exert an influence over railway policies which will give them just such competitive advantages over small shippers as it has been the principal purpose of railway regulation to prevent. Furthermore, insofar as it may affect operating expenses it will either reduce railway net earnings or increase the cost of transportation to the public.

The practices in vogue may need only publicity, and not regulation, but they do need publicity, and this they evidently are going to get as a result of the investigation being conducted by both the Interstate Commerce Commission and the Federal Trade Commission. If they are defensible they can stand investigation and publicity. If they cannot stand investigation and publicity, the business leaders of the country should make further government regulation unnecessary by stopping them. It is bad business for big business to persist in practices which, because they cannot stand investigation and publicity, can be used to justify increased government regulation.

Credit Where Credit Is Due

CONTRARY to popular impression, engineering talent is often afforded greater opportunity for fullest expression in some seemingly prosaic undertaking than in the spectacular project which makes a visual appeal to the imagination of the layman. This is illustrated most emphatically by such work as grade separation in large industrial areas. While construction is in progress, it attracts attention only because of a generally messy appearance of the right of way, and when the work is completed there is little that can serve as a measure of painstaking effort that was put into it. To meet the exacting demands of traffic, provide uninterrupted service to adjacent industries and still permit of expedition in the work is a task requiring a program that is complete to the smallest detail. The design of the necessary bridges calls for a display of a high order of ingenuity and skill by reason of limited clearances, sharp skews, complex problems of alinement and grade, and the presence of such obstructions as sewers and watermains.

The remark of an operating vice-president to a bridge engineer to the effect that, "Your bridges don't look like much when they are finished," was a subtle though forceful expression of appreciation. The completed structures afforded no measure of what they cost in mental effort and dollars.

Some Senatorial Statesmanship

SENATOR Howell, of Nebraska, thinks he has a remedy for the effects of the Supreme Court's decision in the O'Fallon valuation case, which he told the Senate on December 11 is likely to cause an ultimate increase in freight rates of half a billion dollars, as soon as the traffic will bear it. Pointing out that no constitutional question was raised in the case before the court, but that it held the commission's valuation invalid because it had not even complied with the direction given by Congress in the valuation act, that it find, among other things, the cost of reproduction of the property, Senator Howell introduced a joint resolution by which Congress would simply O. K. the principles and methods used by the commission in its O'Fallon valuation order, without bothering to repeal or amend the provision of the valuation act involved.

The resolution provides that the valuation of the property of a railroad "shall be determined in accordance with the principles and methods approved in the report and order of the majority of the Interstate Commerce Commission in Finance Docket No. 3908," that being the case in which the commission attempted to recapture "excess income" from the St. Louis & O'Fallon.

When another Senator, who said he was in full sympathy with Senator Howell's position, but who perhaps is more of a lawyer, raised the question as to whether such a proposal would be sustained as legislation by the

courts, Senator Howell replied that there was no constitutional question involved. "Therefore it may be inferred," he said, "that this is a matter which Congress can deal with, and if Congress will promptly deal with it we will be saved a possible increase in valuations and railroad rates."

No one in the Senate was so unkind as to interrupt Senator Howell's explanation of his simple scheme with a direct suggestion that the Supreme Court, which in this case found it merely necessary to hold that the commission had not even complied with the law, might have something more to say, if occasion should arise, about the constitutionality of such a resolution as the Senator proposed.

Senator Howell figured that as a result of the court decision the valuation of the railways might be increased from $21,000,000,000 to about $30,000,000,000, or 43 per cent, and said that while the increase in rates might not be immediately put into effect, "for years to come, the railroads will be in a position to compel the Interstate Commerce Commission to grant the highest freight rates the traffic will bear." Senator McMaster, of South Dakota, following him, proceeded to discuss the subject as if this meant a 43 per cent increase in freight rates to be imposed on the farmers. Senator Brookhart said he was in sympathy with Senator Howell but was inclined to think that the commission might get around the court decision by simply saying that it had considered the cost of reproduction new, without changing the value already determined.

And yet Senators who become so hot and bothered about the rates they profess to fear will result from the Supreme Court's idea of value decline to worry in the slightest because rates have never yet been kept high enough to produce a fair return on the commission's own basis of valuation.

Utilizing Passenger Stations

THE experience of the Boston & Maine with its new North Station at Boston, was illuminating and worthy of study. In accordance with the time-honored practice, the general offices of the B. & M. were situated in the historic old North Station, before it was torn down to make room for the new structure. This is the plan that is followed in many passenger stations throughout the country, not only for general offices, but for division and other offices.

In building the new station, however, the B. & M. decided upon a somewhat different plan. It was felt that the new station afforded possibilities as a revenue producer, apart from its primary purpose of providing a comfortable and convenient entrance and exit for passengers to and from Boston. One of the departures was the provision of an unusual amount of space for stores, not merely the usual news-stands, drug stores and tobacco shops, but a wide variety of shops such as one might find in any metropolitan shopping district. This, in itself, is not entirely unprecedented for such shops are to be found in one or two other stations in other large cities.

Matters were not, however, permitted to rest there. One of the upper floors was turned into an indoor arena where sporting events of all sorts are held. This brings in revenue, not only from rentals for the space occupied, but also in the way of passenger traffic. A survey made recently by the B. & M. shows that several thousand additional passengers travel into Boston weekly, whose only purpose is to attend the events at the Boston Garden. With the parking difficulties that exist in Boston, as in other cities, large and small, coming in on the trains, with the destination just upstairs, is far more convenient than any other means of transportation.

Of course, the situation varies in different cities, but the North Station is more or less typical, since its location with reference to the center of activities in Boston is no more favorable than that of other stations with reference to other civic centers. The example furnished by the B. & M. at North Station shows that passenger stations may be made to produce a considerable revenue, apart from their primary purpose, a fact which should not be overlooked when and where a similar opportunity exists.

Traffic Considerations in Freight Trucking

MOST railroads which have entered the motor coach field operate their highway passenger services so as to suit the peculiar demands of the motor coach patron. They have, in the main, organized their own subsidiaries, many of which, with suitable traffic promotion and development, have become profitable enterprises and thus sources of increased revenue to the railways which own them.

Railroads entering the motor truck field, on the contrary, have, with few exceptions, proceeded along different lines. Highway freight operations now conducted by steam railways are mainly in the nature of terminal interchanges or station-to-station movements. Here trucks perform no service for the patron which he could not procure from the trains for which these trucks have become economical substitutes. In other words, while traffic considerations have entered the development of railway motor coach services, they have, to date, been largely ignored in railway motor truck operations.

This point was well stated in the report of regional committee No. 6, of the Motor Truck Section, Motor Transport Division, A. R. A., at the recent Toronto meeting. It was the general impression of this committee that railroads are but slowly adopting the motor truck, and that such applications are almost entirely in the realm of terminal work. "The reason for this situation", this report continued, "is that the railroads have approached

the question of truck use almost entirely from the angle of savings in operating expenses. . . .Traffic considerations have not been given the same weight in consideration of truck problems as in motor coach problems. . . . With these two diametrically opposed plans it is reasonable to assume that the shipper will use the kind of service which appeals to him, even though at times it may cost him more money."

The report then pointed out specifically how in their highway passenger operations the railways have established off-track stations, agencies and other facilities peculiarly suited to the needs of the traffic. While not advocating store-door delivery, the committee continued to call attention "to the fact that in meeting the passenger competition the railroads went into the motor coach business, organized subsidiary motor coach companies, and through them do all things any independent motor coach company does, and do them better."

This report's conclusion, therefore, would seem to require no amplification since it finds "a natural assumption that the remedy being applied with respect to passenger transportation would be equally efficacious with respect to freight transportation, and that the establishment of trucking subsidiaries to give services similar to those of private trucking companies in territories where trucking companies are real competitors of the railroads might well have the serious consideration of railway executives."

Trend of Freight Business

AS the year 1929 draws to a close, the trend of railway freight business is definitely downward, but as yet the decline, as indicated by car loading reports, is not sufficient to cause alarm. Car loadings began to be less in the week ended October 5 than last year. They have shown a reduction of about 3,000 carloads a week in October, 47,000 carloads a week in November and over 50,000 carloads a week in the early weeks of December.

In the last ten weeks for which figures are available shipments of miscellaneous and less-than-carload freight amounted to about 6,650,000 carloads as compared with about 6,770,000 carloads last year. Shipments of grain and grain products were the smallest for any corresponding period since 1920, being only about 425,000 carloads as compared with 539,000 last year. Shipments of forest products were the smallest in five years, being only about 580,000 carloads as compared with about 645,000 carloads last year. Coal shipments were just about the same as last year. Total car loadings were about 10,500,000, as compared with about 10,800,000 last year.

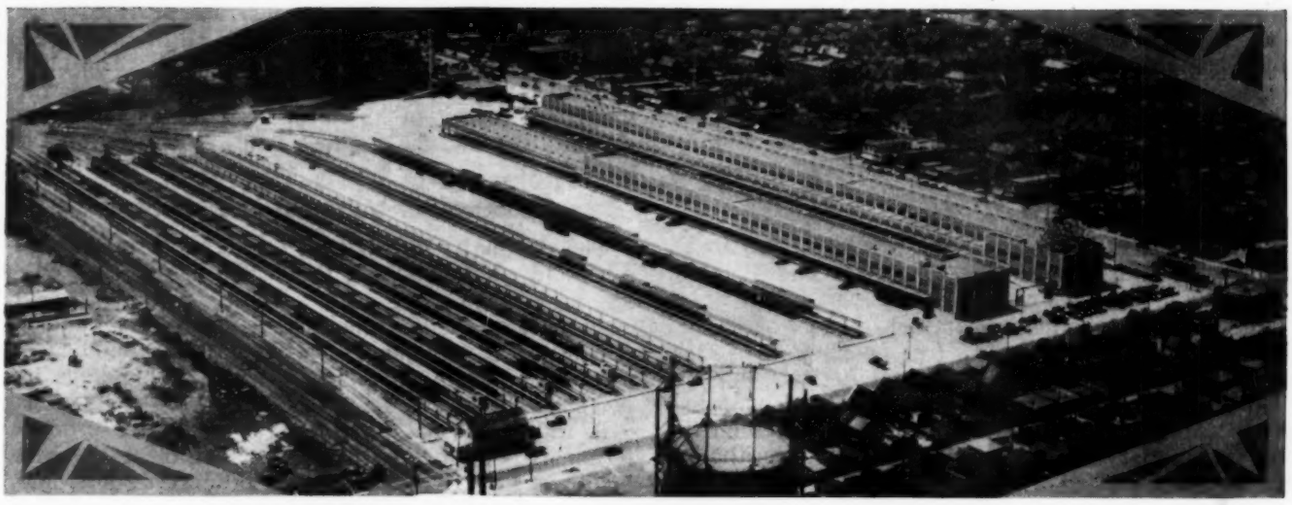
It seems to be agreed by President Hoover and the leaders of business who have been co-operating with him that the first quarter of 1930 will be the critical period in determining whether their efforts to maintain general business will be successful. It is hardly to be expected, however, that any of the effects of their efforts will be reflected in railroad freight business during the early months in the year, and, as traffic in the first quarter of 1929 was unusually heavy, it will undoubtedly show a decline in the first quarter of 1930. The railways probably will have to wait until the second quarter of the year for any part of the benefits that may accrue to them from the exertions now being made to maintain general business.

Increasing Traffic by Special Train Services

IT is a well recognized merchandising principle that sales expense incurred in promoting a product which finds a ready market is more productive of revenue than similar expense incurred to market a relatively unpopular commodity. The railroads recognize this principle in their advertising of passenger service by laying their main emphasis on through service, which is that phase of passenger business which offers the greatest promise of expansion. There is a form of through passenger service, however, which the railroads offer which does not seem to be adequately appreciated, i.e., special train service. It is true that, when conventions are planned by associations, railroad passenger departments engage in a great deal of sales effort, frequently with outstanding success, in arranging for the transportation of delegates on special trains. On the other hand, in such negotiations, it is generally the officers only of these associations who hear the railroads' sales message. While individuals who ride in special trains certainly recognize the amenities of such service, is it not entirely possible that they may overestimate the difficulty of arranging for it?

It is probable that special passenger trains are one of the most attractive services which the railroads have to offer. For conventionists, by permitting them to be thrown together for several days of traveling, the effective duration of such meetings is not restricted to the actual sessions, but begins when the delegates leave their homes and extends until their return. Furthermore, the service is one which no other form of transportation, save possibly the steamship, can offer. There are many passengers who will ride special trains to be with their friends who would otherwise travel by automobile.

Might not the advantages of special train service, and the fact that the railroads are really interested in providing it, make an effective thesis for advertising treatment? If the public generally were to have the desirability and comparative ease of securing such service firmly impressed upon it, a considerable increase in this class of business might result.



The New Terminal Extends Over 26 Acres

Railroads Build Modern Produce Terminal at Detroit

Unusual features are incorporated in new $5,000,000 union facility of the Pennsylvania, Pere Marquette and Wabash—Completed in 100 days

By J. Wm. Moffett
Supervising Engineer, United Engineers & Constructors, Inc.

DETROIT, Mich., has one of the finest and most up-to-date perishable produce terminals in the country, constructed during the last year as a joint facility by the Pennsylvania, the Pere Marquette and the Wabash, and known as the Detroit Union Produce Terminal. It occupies a fully developed area of about 26 acres. Essentially its facilities consist of two long auction sales and office buildings, a large banana building, 2,048 ft. of bulk delivery platforms, 9,936 ft. of produce inspection platforms, 4,416 ft. of icing platforms built in conjunction with the inspection platforms, a boiler plant, a well-equipped stevedores' building, about 70,000 sq. yds. of concrete paving and approximately 10 miles of tracks.

Actual construction of the new terminal followed a most extensive study and survey of other produce terminals in the country, and no expense was spared in construction to make the Detroit facilities meet the problems of the produce trade in that city. As a result, the new facilities are not only modern in every respect, but incorporate a number of unusual features in both construction and operation.

Old Facilities Were Totally Inadequate

For a number of years the facilities for handling perishable produce at Detroit have been inadequate. The sale of produce was conducted directly from cars located at various places in several railroad yards. This necessitated a large force of salesmen working out of doors in all kinds of weather, in both summer and winter. As there was no agency for assembling and disseminating information, there was practically no control over the flow of produce into Detroit and no record of the amount of produce consumed. Buyers appeared at the railroad yards as early as two o'clock in the morning and waiting salesmen would attempt to direct them to where their cars were spotted in scattered locations. Car lots were broken, partly sold, and then frequently held for several days until sold out, resulting in excessive car delays, demurrage charges and re-icing expense. In addition, the produce frequently deteriorated and, in such cases, the receivers were burdened with heavy losses.

The metropolitan area of Detroit includes about two million people, with another million within two or three hours trucking distance. It was plain that some plan had to be found to develop accurate data on the current produce demand, to speed up selling, to protect the quality, and to reduce speculation and hasten the distribution of produce, not only as regards the large Detroit market itself, but also with regard to the markets of the smaller cities and communities within trucking distance. It was felt that at prices made possible by lower operating costs, the local carload receivers should sell double the amount of fresh fruits and vegetables consumed the previous year.

As a result of a careful study of the situation, a committee made a tour of inspection of the larger cities of the country to observe their solutions of their problems, and then proceeded with comprehensive plans for a union produce terminal for Detroit. It was planned that the terminal should be open to all shippers and railroads, embrace every known convenience, and incorporate a number of new features in order to make possible the rapid and efficient handing of carload lots of fresh fruits and vegetables.

Equal ownership in the terminal was offered to all trunk line railroads entering Detroit. The Wabash, Pere Marquette and Pennsylvania exercised their rights to become participating owners on an equal basis, and organized a special company for the purpose of construction, known as the Green Real Estate Company. The site chosen lies along a jointly-operated main line of these roads and contains 40 acres, 26 acres on the north side of the right-of-way and 14 acres on the opposite side.

New Terminal is Well Laid Out

As constructed, the new terminal proper occupies only the 26-acre plot north of the main line, bounded on the north by West Fort street, on the south by the railroad, on the east by Green avenue and on the west by Springwell's avenue. The facilities provided are laid out in a generally east and west direction, and include two long auction sales and office buildings, served by tracks, which front on Green avenue and lie along the north side of the property parallel with West Fort street. Immediately west of the more southerly of these buildings is a banana house, and further to the west, along the west side of the property, are a well-equipped stevedores' building, a boiler house for supplying heat to the terminal buildings, and an incinerator plant for disposing of all waste produce and refuse at the terminal.

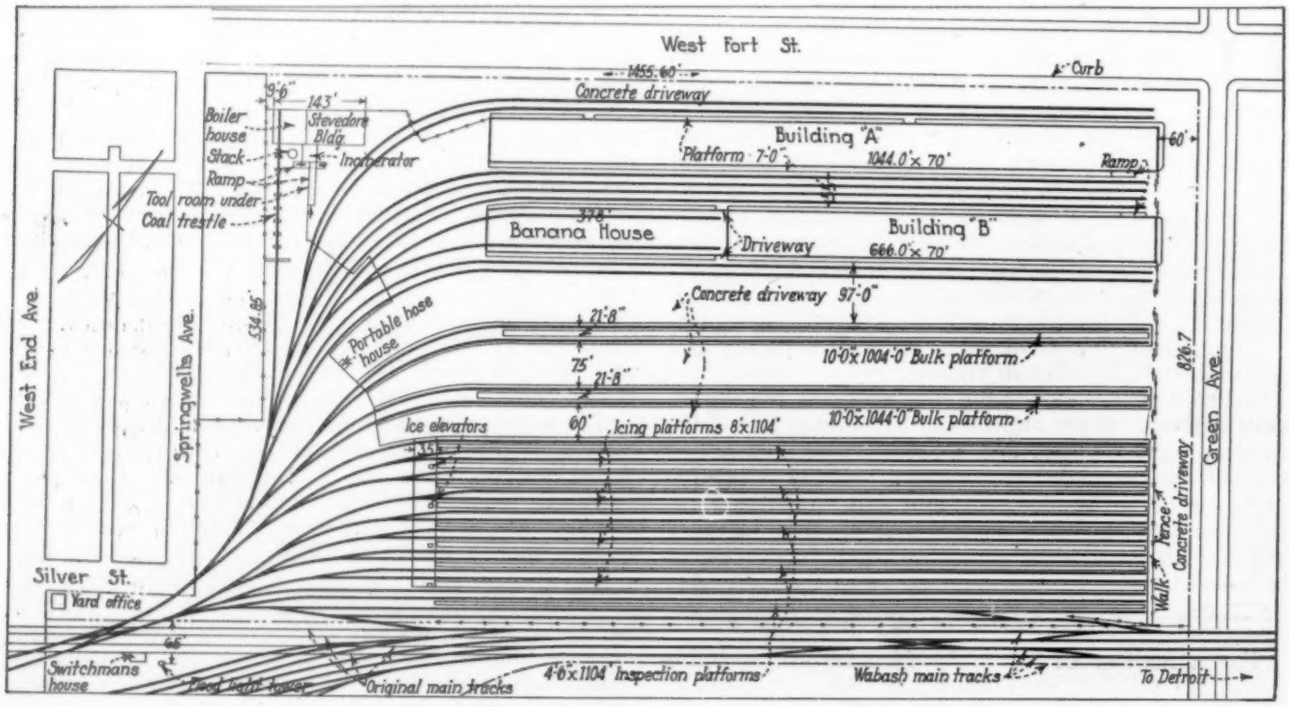
South of the auction sales buildings, and parallel with them, are two long bulk delivery platforms, served on both sides by tracks and wide paved driveways, and still further to the south is a series of nine long inspection platforms, four of which are provided with upper decks for car-icing purposes. All of these platforms are served by tracks on both sides. The main leads to the tracks at the terminal proper enter at the southwest corner of the property and extend from classification and hold yards lying southwest of the terminal site.

Auction Sales and Office Buildings

The two major buildings at the terminal are auction sales and office buildings, designated as "A" and "B" on the accompanying plan. These buildings are of more or less similar construction and detail, building A being 70 ft. wide and 1,044 ft. long, and building B, of the same width and 666 ft. long. Both buildings are two stories in height.

A rather unusual condition for perishable produce terminals is the necessity for providing offices in these buildings for a large number of produce dealers, and, incidentally, offices of the character to be found in a modern office building. Such offices were provided on the second floors of both buildings, and, as a result, the buildings are rated outside of the industrial class to a considerable extent.

The fact that the terminal site is located on one of the main highways entering the city, and faces on another street which will eventually form an important link in Detroit's master plan for future development, demanded that the exterior of the buildings be attractive in appearance. The principal architectural problem involved was the choice of a treatment which would avoid a squatty appearance in two-story buildings of great length. In solving this problem, iron spot buff bricks with a range of color were used in panels between concrete pilasters, with ornamental tapered finials extending above the parapets. In addition, the vertical lines were exaggerated as much as possible, with pleasing results as to the proportions of the buildings. Loading platforms, seven feet wide, extend along both sides of the buildings, protected by cantilevered canopies of



General Layout Plan of the New Union Produce Terminal

structural steel with precast concrete slab decks covered with slag-surfaced built-up roofing. The edges of the concrete platforms are protected with steel angle nosings and oak bumpers.

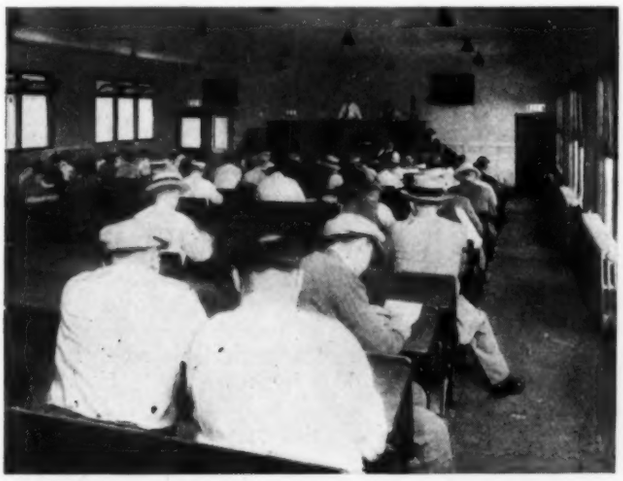
Both structures are of reinforced concrete, carried on spread footings. The first floors of the buildings are of the flat-slab type, while the second floors and the roofs are of beam-and-girder design. The buildings are three bays wide, and are divided into 18-ft. panels longitudinally. The first four panels of the second stories at the Green avenue end extend the full width of the buildings, but the remainder of the second floor in each case is only two bays wide. The third-bay area of the second floor in each building is occupied by a low roof over one side of the first floor, which is provided with a continuous row of flat skylights to afford daylighting to the center bay of the produce display floor below.

The doors along both sides of the display areas in both buildings are 14 ft. wide by 8 ft. high, and are of the counterweighted bifolding type, manually operated. Just above these doors are glazed steel sash, which provide further daylighting of the display floors. The method of daylighting provided is, as a whole, particularly effective, especially for this type of building, in that it displays the fruits and vegetables in their natural colors. All of the other windows in the buildings have wood frames and sash, except a few openings at the Green avenue ends, which are of the steel casement type, provided for architectural reasons.

Particular attention was given to the finish of the floors in the display areas, because of the almost continuous stevedore trucking to which they will be subjected. Before the structural concrete floor slabs had fully set, granite chips were spread over the surface and rolled in, forming a hard and compact wearing course. This surface was later ground twice with terrazzo grinding machines, which resulted in a hard granolithic finish, resembling terrazzo in texture.

Considerable thought was given to the detail arrangement of these floors. Space for each carload is outlined on the floors by painted bands. Main aisle spaces are reserved at each side next to the outside walls, instead of at the center of the house as has been customary, and, therefore, the sellers for the different dealers are kept from interfering with each other. The floors are pitched to the center of the buildings to drain the water from melting ice in the packages away from the selling aisles.

The main entrances and stairways to both of the



The Modern Auction Auditorium is a Great Convenience to Both Buyers and Sellers

Looking Over the Combination Inspection and Icing Platforms at the Terminal

auction sales and office buildings are on Green avenue. The floors of the hallways at the ground and first-floor levels are of light Tennessee marble, with marble steps and risers up to the first floor, and wrought iron and pressed steel stairs, with marble treads, continuing to the second floors. The wainscot and base are of Zenitherm, with cast bronze grilles in front of concealed radiators. The stairways were made more interesting in their treatment by an arrangement of arched openings in the walls, supplemented by a number of balconies with wrought iron railings.

At the right of the main entrance to Building A is a branch bank, while at the left is a sellers' locker room, with toilet and shower rooms finished in marble and tile. The remainder of the first floor in this building, with the exception of one office, a small storeroom and the space required by stairways and toilets, is devoted to the display of produce.

Auction Auditorium in Building A

The second floor of building A is laid out in offices for the representatives of the interested railroads and the terminal operating company, private offices for the many produce dealers, Western Union and Postal telegraph offices, a fully equipped modern barber shop, an auction auditorium seating 230, and auctioneers' offices and living quarters. The partitions dividing these areas are all of hollow tile with a sand plaster finish, and liberal areas of borrowed lights are provided along the corridor. The ceilings likewise have a sand plaster finish, and are suspended some distance below the roof structure to provide insulation against extremes of outside temperature.

Among other details of construction, the corridors have a Zenitherm base and wainscot, and the trim is of gum, stained walnut and covered with flat varnish with a rubbed finish. The doors are two-paneled, with syenite glass in the upper panels, and the corridor floor is covered with battleship linoleum laid in tile pattern with border. The rooms have floors covered with ¼-in. brown battleship linoleum, except the auditorium, which has corrugated rubber runners in the aisles. The runners were provided to avoid slipping, as the floor in the auditorium is sloped to make it possible for the auctioneer to see bidders in the back rows of seats. The ceiling of the auditorium is finished with an acoustic treatment to deaden sounds. Other special features in the auditorium include a mechanical means of ventilation and a special non-glare type of electric lighting fixture.

The toilet rooms provided in the building have tile floors and wainscot, with marble cubicle partitions. Toilet ceilings and walls above the wainscoting are

Looking Over a Section of the Display Platform in Building B

finished in white enamel. Other walls in the office areas and in the auditorium are painted a warm golden color with cream-colored ceilings, both in flat finish paint.

Each office is fitted with a lavatory supplied with both hot and cold water, the hot water being furnished from automatic gas heaters located on the first floor. There are four ceiling light fixtures in each office and a generous supply of base plugs and telephone outlets. Telephone booths are provided at frequent intervals throughout the building and, in fact, throughout the entire terminal so that the outside men can keep in close touch with their offices and make such long-distance calls as may be necessary.

Building B is laid out and finished in much the same manner as Building A, except as demanded by differences in occupancy. The main entrance at the first floor opens into a large assembly room for buyers. The greater part of the first floor, as in Building A, is devoted to produce display space.

As the terminal was intended to be as self-contained as possible, the second floor of this building is provided with a restaurant with a seating capacity of 200. Three classes of service are provided, namely, a lunch counter, a cafeteria and private dining-room service, each in different rooms.

The kitchen is finished with glazed tile walls and a quarry tile floor, and is as fully equipped for the storage and the preparation of food as the most modern hotel, even to including a bake shop. An electric-operated elevator is provided to carry bulky supplies from the first floor to the kitchen. The remainder of the second floor is laid out in offices as in the case of Building A.

Special Building for Handling Bananas

Immediately adjoining the west end of Building B is a one-story reinforced concrete building, 70 ft. wide by 378 ft. long, provided chiefly for the purpose of unloading carloads of bananas in freezing weather. It is probable that carloads of produce touched by frost in winter months will also be run into this building and partially thawed out.

Two tracks enter this building from the west, with space between them for trucking. Trucks may enter from either end and leave at the opposite end of the building. The building is heated so that any desired temperature can be maintained during the winter. Platforms with canopies are provided along each side of the building, and rolling steel doors are provided in each panel so that the building can be used in the summer months for bulk delivery. The ground floor paving is at grade for trucking purposes, but this space can be changed to a display floor by adding a deck at the same elevation as the first floor in Building B adjoining. Provision was made in the design of this building for a future second story.

Terminal Has Extensive Track Layout

There are approximately ten miles of tracks on the new terminal property alone. Thirty-one tracks stubbed at Green avenue lead off from two ladders entering at the southwest corner. One other track runs over a trestle serving the coal bunkers at the boiler house. Altogether there are eight house tracks at the two auction sales buildings, four team tracks at the bulk delivery platforms, 19 tracks in the hold and inspection yard, two banana-house tracks and one coal track. The rated car capacities of these tracks are as follows: House tracks, 160; team and platform tracks, 148; inspection and storage tracks, 515; coal track, 2; and banana-house track, 16; or a total capacity of 841 cars.

Nearly 70,000 sq. yd. of reinforced concrete paving was laid about the terminal for driveways, these being finished flush with the tops of rails. The rails were welded at all joints, and were spiked to creosoted ties supported on and imbedded in concrete. The buildings are set 52 ft. back from the street line along West Fort street and 60 ft. along Green avenue. The old sidewalks and curbs were removed and the new concrete was continued out to the street gutters in both cases.

The driveways in the yard are sloped to a generous number of catch basins, not only to carry away rain water quickly, but to make it possible to clean the yard readily by flushing from the hose connections provided. The underground system of sewers and drains involves three miles of pipe.

Both the supporting yard and the terminal yard are illuminated generally from a 100-ft. floodlight tower. Additional yard lighting is provided by lights on the sheds over the bulk delivery platforms and along both sides of the two main buildings. At the various platforms, connections are arranged for portable lights for illuminating the interiors of cars.

Bulk Delivery, Inspection and Icing

The two bulk delivery platforms, which have an average length of 1,024 ft. each, are located south of and parallel with Building B. They are ten feet wide, with a reinforced concrete slab deck cantilevered across two longitudinal beams, which, in turn, are supported on concrete piers with spread footings spaced 20 ft. center to center. The platforms are protected with structural steel umbrella sheds having a single row of steel columns and a roof covering of asbestos-protected corrugated iron.

In the inspection yard, which lies along the south side of the property, there are nine platforms, each 1,104 ft. long. Five of these platforms are similar in construction to the bulk delivery platforms, but are only 4½ ft. wide. The other four platforms are double-deck structures, eight feet wide, constructed entirely of reinforced concrete. In these latter platforms, which represent something new in combined car icing and inspection platforms, the lower deck is used for inspection and the upper deck is used entirely for the icing operation.

In the icing operations, the cakes of ice are moved from east to west over the platforms by chain conveyors, driven by motor-operated machines located in small reinforced concrete houses on the upper decks at

the west ends of the platforms. The return strand passes through a trench in the icing deck.

Ice is brought to the terminal by cars or trucks and is raised to the icing platforms by means of stationary ice elevators, which are motor-driven and automatic in operation. When a cake of ice is placed on one of the elevator gigs, it is raised automatically and discharged on to an inclined slide, over which it passes to the chain conveyor. The gig immediately drops to receive another cake and the operation continues as before. Remote-control stations are provided at intervals along the icing platforms with stop, start and reverse buttons, and a limit switch is provided in front of each conveyor machine house, so that if a cake of ice goes by the conveyor operator, there will be no possibility of the conveyor becoming jammed. The ice is removed from the conveyors by men stationed along the platforms where cars are to be re-iced. These men break the ice cakes and slide the pieces down chutes into the bunkers of the cars located on the tracks on each side of the icing platforms. Altogether there are 16 tracks in the inspection yard where cars may be re-iced in this manner. Cars which stand elsewhere in the terminal are reiced when necessary by means of a motor truck with an elevating body, as is done in other produce yards. No motor trucks can get to cars standing on the tracks in the inspection yard.

Adequate Auxiliary Buildings are Provided

The steam heating plant at the terminal is located at the northwest corner of the property along West Fort street, in a building 35 ft. by 55 ft. and provided with a coal bunker room 17 ft. by 55 ft. immediately adjoining it. Four low-pressure, down-draft, smokeless-type boilers are installed in this plant, with space provided for a fifth boiler when required by future extensions. The sub-division of the steam heating plant into several units was provided so as to make possible maximum economy and flexibility of operation. The plant has a radial brick stack with a top inside diameter of 5½ ft. and a height of 125 ft. Coal is brought in by the carload over a trestle and is discharged directly into bunkers in front of the boilers.

A stevedores' building, 143 ft. long by 54 ft. wide, adjoins the boiler house on the east and houses a lunchroom, a locker room and a toilet for stevedores, in addition to a timekeeper's office and a printing shop. Within the printing shop are prepared the daily bulletins and various notices for the terminal.

An incinerator building, 23 ft. by 27 ft., adjoins the south side of the stevedores' building, near the boiler house. The incinerator is vented to the boiler stack and is designed to destroy 2,000 lb. of garbage per hour. A ramp is provided, which allows trucks to back up to a second floor in the building and discharge waste either on the floor or directly into the incinerator. Other ports to the combustion chamber of the incinerator are provided on the first floor for feeding in long pieces of lumber and such rubbish as may be taken from the cars. Incombustible matter, such as metal bands from cases and similar materials, is removed at the first floor level.

All of the buildings in this group are of reinforced concrete and beam and girder design, with brick panel walls of an architectural treatment harmonizing with the main buildings.

Terminal Has Unusual Operating Features

In carrying out the operation of the terminal, the cars of fruit and produce consigned to carlot receivers are collected during the day in the supporting yard, and are then classified and spotted in the hold and inspection yard late in the afternoon. The next day the consignee opens his cars, inspects the contents and notifies the terminal how the cars are to be disposed of. In this latter regard he may choose one of several courses. He may order certain cars placed on the house tracks for unloading to the display floors for auction sale, or, if it happens to be a carload of potatoes, cabbages, juice grapes or any other item for which he has secured, or expects to secure, a carlot purchaser without a railroad siding of his own, he may order the car delivered to the bulk delivery platforms for unloading direct to the customer's trucks. If the purchaser has his own siding, the car is usually reconsigned accordingly. During the day, as the disposition of the different cars becomes known, the ice bunkers of the cars are checked and re-iced as required.

In most produce terminals, the inspection yard tracks are arranged with a driveway on one side so that cars on these tracks can be unloaded where first spotted. This method was in use in the old Detroit yard and, in fact, the business had to be handled in that way as no adequate display floors were provided. This system caused so much wastage and inefficiency in disposing of the produce that it was decided to avoid any possibility of such a condition arising at the new terminal. Consequently, the inspection tracks were spaced close

The Office and Auction Sales Building

Main Corridor in Building "A"

together, without driveways serving them, so as to make it impossible to reach the cars in the inspection yard for unloading.

The entire terminal yard is turned over to the railroad switching crews in the afternoon at four o'clock. The empty cars are removed from alongside the bulk delivery platforms, and all cars are taken from the inspection yard and spotted on the house tracks and on the bulk delivery tracks. Cars which are to be held are replaced along with the new receipts in the hold and inspection yard.

As soon as the cars are placed on the house tracks, the stevedore crews commence to unload them and to place the produce on the display floors. The empty cars at the houses are then removed during the night, leaving the space about the buildings open for tailboard delivery to trucks the following morning.

In the method of selling followed at the terminal, which is known as the "platform" method, the buyers and sellers assemble in their respective rooms early in the morning. At a signal given by means of electric gongs, the sellers take their stations by their various lots of produce and the buyers pass through the display floor of Building B, and then through a tunnel beneath the driveway at the west end of this building, over to Building A. On another signal, the buyers assemble for the auction sale held in the auction auditorium on the second floor of Building A. At the end of the auction sale the gates of the fence surrounding the terminal are thrown open and the buyers rush a list of the items they have bought to each of their trucks, which, in the meantime, have been parked outside the fence along Green avenue. Each list of purchases carries the number of the door at which the truck is to receive its load.

By far the greater part of the activity at the terminal occurs early in the morning. It is required by the operating rules of the terminal that all produce be off the display floors by 4 p.m. After this hour the buildings are cleaned up and made ready for the next day's business. All produce to be placed and sold on the terminal floors must be ordered in not later than 3 p.m. of the day previous.

The platform method of sales assures several distinct benefits. In the first place, the terminal company knows in advance just what merchandise is to be offered for sale the following day, and is thus able to advise shippers and growers accurately on the state of the Detroit market. Speed in selling is inherent in this method as the whole supply is displayed on the floors in plain view of all buyers. Speed in selling, in turn, protects the quality and accelerates distribution. The market is stabilized, yet responsive to supply and demand.

On the basis of business done at the new terminal in the first weeks of operation, there is no doubt but that more than 50,000 carloads of fresh fruits and vegetables will be handled in this facility in its first 12 months of operation. The cultivation of a wider market through more intensive retail consumption and broader geographical limits is now a foregone conclusion as a result of the new facilities provided. Costs are being cut, and with lower costs will come lower prices and therefore, increased business.

Remarkable Speed Made in Construction

The speed with which the work at the terminal was carried out is of considerable interest. The engineering and architectural designs were commenced on January 15, 1929, and the program laid down called for the completion of the project on August 1. Actual construction work was not started until February 21, but, in spite of this, by July 1, the regular routine of the terminal was in full operation with many of the facilities taxed to the utmost. This was one month earlier than planned, in spite of the fact that several major items were added, which were not at first contemplated by the schedule. The banana building, for example, was not authorized until May 14.

The entire project was carried out under the direction of an engineering committee consisting of the chief engineers of the interested railroads: M. F. Longwill, chief engineer of the Wabash; I. W. Geer, chief engineer of the Western region of the Pennsylvania; and H. A. Cassil, chief engineer of the Pere Marquette. J. C. Bousfield was resident engineer for the Green Real Estate Company. Dwight P. Robinson & Company, Inc., a division of United Engineers & Constructors, Inc., Philadelphia, Pa., prepared the designs and did the construction work. The terminal facilities are leased by the Detroit Union Produce Terminal, of which Frank N. Isbey is president and Stuart C. Lockman, general manager. The cost of the terminal was approximately $5,000,000.

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The Pennsylvania-Norfolk & Western Engine Terminal a t Hagerstown, Md.

I.C.C. Consolidation Plan

Commission promulgates allocation of railroads to twenty-one systems

WASHINGTON, D. C.

THE Interstate Commerce Commission has finally succeeded in consolidating its thoughts as to how the railroads should be consolidated, to the extent of promulgating a 68-page pamphlet containing, in addition to expressions of individual commissioners' views, a plan for allocating approximately a thousand railroads among 21 systems, including the United States lines of the two Canadian systems, but leaving some 200 terminal properties for later consideration.

The plan provides for two New England systems, exclusive of the Canadian mileage, each having lines into New York; five eastern systems, one of which, the Wabash, would extend west to Kansas City and south to Florida and another of which, the Baltimore & Ohio, also would be extended to Kansas City by the addition of the Alton; three southern systems, each with access to Chicago, nine western systems, one of which the Chicago and North Western, would also extend south to the Gulf; and the two Canadian systems of the Canadian Pacific and Canadian National. The number of systems proposed is the same as that in the tentative plan of August 3, 1921, except that the latter did not attempt to deal with the Canadian lines. The new plan, however, allocates the short lines, most of which were not considered in the tentative plan.

A noticeable feature of the plan is the number of proposed systems that are made to extend across the usual territorial lines. The Wabash would be made not only a western and eastern line, but also a southern line. The Baltimore & Ohio would reach out of eastern into western territory, and the Chicago and North Western would be extended to the Gulf by the Chicago & Eastern Illinois and the Mobile & Ohio.

Adopted by the commission on December 9, the plan was made public on December 21, and the interval required for printing allowed an opportunity for the essential details to "leak" out in advance, as was also the case with the tentative plan. The commission thus complies with its promises made earlier in the year when it decided to proceed with the preparation of the plan after Congress had failed to take action on proposed legislation to amend the consolidation provisions of the transportation act. The commission in four successive annual reports had recommended that the law be amended and that the requirement of a plan be omitted, but more recently some of the commissioners had come around to the view that there should be a plan and the Fess bill, now pending in the Senate, provides that the commission shall prepare a plan before acting on individual applications. The Parker bill, in the House, omits the plan feature.

Plan Subject to Change

The new plan is published, to comply with the requirements of section 5 of the act, in the light of the hearings held following the promulgation of the tentative plan in 1921, but also takes into consideration various developments since then and to some extent the desires of various roads as expressed in unification applications filed under paragraph 2 of section 5. The law provides that plans for complete consolidation, to be approved, must be in harmony with the commission's plan, but also that the commission, either upon its own motion or upon application, may reopen the subject for such changes or modifications as in its judgment will promote the public interest.

Many of the lines allocated in the plan are now under the control of other systems directly or indirectly, such as some of the properties recently acquired by holding companies affiliated with the Pennsylvania system, as well as some which have long been under the present control. The report says that "the continuation or acquisition of inter-system interests directly or indirectly through holding companies, stock ownership, or otherwise, will be inconsistent with the independence necessary to true competition" and that carriers will be expected "to observe this requirement in submitting proposals for consolidations and to co-operate in establishing the desired status." This does not discuss the situation of a company which now controls more than is allocated to it in the plan and which might not submit any proposal for consolidation, but Commissioner Eastman suggests the desirability of using the anti-trust acts to "pry" certain roads apart.

Most of the roads involved in anti-trust proceedings now pending before the commission, such as the Wabash and Lehigh Valley, the Western Maryland, the Wheeling & Lake Erie and the Mobile & Ohio, are grouped in the plan with systems other than those which now control them.

Differences of Opinion

While there remain many differences of opinion among the commissioners as to parts of the plan a majority have agreed to each part and all concurred in the result. Four commissioners wrote separate expressions of their individual views, Eastman, Porter and Taylor concurring in part and McManamy concurring. Commissioner Eastman outlined a series of systems differing considerably from that of the plan and Commissioner Porter, who had submitted a preliminary plan some months ago, gave a somewhat lengthy expression of his views, including an exposition of the advantages of a four-system plan for the eastern roads over the five-system plan. Commissioner McManamy concurred in the plan because under the law a plan is required and "because it will cut the Gordian knot" and not because he expects economy and efficiency of operation to be promoted by the gigantic systems here proposed."

Commissioner Eastman said it is not very important, after all, whether or not this is the best plan that can be devised. "We may modify it at any time hereafter," he said, "and no consolidation for which it provides can be accomplished until we have found, after full hearing, that the public interest will be promoted thereby. There is, I think, much misunderstanding on this point. The plan is very little more than a procedural step. There is nothing compulsory about it, nor even any assurance that authority will be sought to carry out the consolidations which is proposes. Applications for au-

thority to effectuate certain unifications are now before us which in many particulars are inconsistent with the plan. The important time will come when we take action upon these and similar definite applications."

Contrasts Between Plan and Pending Application

The principal lines now controlled by the Van Sweringen interests, which they have long been trying to unify, are placed in the Chesapeake & Ohio-Nickel Plate system, with the addition of the Lackawanna, the Bessemer & Lake Erie and various short lines, but the Wheeling & Lake Erie, now controlled by the Nickel Plate, and the Virginian, are allotted to other systems.

The Pennsylvania and New York Central systems would not be greatly increased by the plan, while many lines in which the Pennsylvania has a direct or indirect interest are distributed among other systems. The Virginian is added to the New York Central. The Baltimore & Ohio is allotted the Reading and Central of New Jersey, for which it has vigorously contended, and also the Buffalo, Rochester & Pittsburgh, the Chicago & Alton and a half interest in the Monon, but the Western Maryland, in which it has a large stock interest is placed in the proposed Wabash system. The Baltimore & Ohio had also asked for the Wabash, so that the system proposed for it by the commission has considerably less mileage than that asked for in the application now pending.

The New England Systems

The New England lines, except the Canadian lines, are divided between the New Haven and the Boston & Maine and the Delaware & Hudson is allotted to the B. & M., while the New Haven is given the bridge lines of the Lehigh & New England and Lehigh & Hudson River.

The proposed Wabash system follows in many ways the "fifth-system" plan proposed a few years ago by L. F. Loree, but the D. & H. is not included and the system as proposed goes far beyond what was asked in the Wabash application. Mr. Loree's latest proposal for an Atlantic seaboard terminal system is ignored and the lines included in it are scattered through various systems.

The Monon, now jointly owned by the Southern and Louisville & Nashville, is proposed to be shared by the Baltimore & Ohio, (one-half) and the Atlantic Coast Line and Southern. (each one-fourth).

The Atlantic Coast Line system is largely built up around lines already affiliated but it is proposed to add the Gulf, Mobile & Northern and New Orleans Great Northern. The Southern, under the plan, would lose control of the Mobile & Ohio but would be allowed to acquire the Florida East Coast. The Illinois Central system as proposed includes the Minneapolis & St. Louis and the Cotton Belt.

The commission's views as to the pending application of the Great Northern and Northern Pacific are indicated by the fact that these two properties are placed in a single system without the Burlington, which is constituted as a separate system with the addition of the M-K-T. To the Milwaukee is added the two lines now controlled by the U. S. Steel Corporation, the Duluth, Missabe & Northern and the Duluth & Iron Range. The Union Pacific and Southern Pacific systems are left very much as they are with the addition of some short lines, but the Kansas City Southern is placed with the Union Pacific. The Chicago Great Western is included in the Santa Fe system. The Missouri Pacific system includes the Denver & Rio Grande Western and the Western Pacific. System No. 19 would put together the Rock Island and Frisco, which now are to an extent affiliated.

While much of the plan is in accord with expressed desires of roads that wish to add to their systems or to unify lines now controlled, most railroad officers take the position that further consolidation legislation is still necessary to enable the consolidations to be brought about, even if the commission should, upon application, approve the terms and conditions proposed. For example, the present law provides only for consolidation into a single corporation and requires that the capitalization of a corporation which is to become the owner of the consolidated properties shall not exceed the value of the consolidated properties as determined by the commission. This would mean that a considerable period must elapse before a consolidation approved by the commission could be authorized and made effective.

The text of the report and of the lists of roads by systems (omitting the terminal properties not allocated) follows:

Plan of the Commission

The commission having, on August 3, 1921, agreed upon and issued a tentative plan of the consolidation of the railway properties of the continental United States, and having given the same due publicity and notice, including notice thereof, to the governor of each state, also notice of hearings to be held by the commission relative to said tentative plan, and having in pursuance of said notices, at various times and places, proceeded to hear all persons who filed or presented objections thereto, together with any and all persons making known their desire to be heard, and said hearings having been fully concluded and the record closed, the commission does not proceed to prepare and adopt a plan as hereinafter set out for such consolidation of the railway properties of the continental United States into a limited number of systems, all as required by section 5(4) and (5) of the interstate commerce act.

Treatment of Terminals Postponed

Our plan does not at present contain a complete allocation of terminal properties to individual trunk lines. Generally speaking, the terminal railroad properties, wherever located, automatically fall into the aggregation of terminal properties of which they are a part. We think that consolidations should be accompanied by the unification of all terminal lines in the respective terminals. All terminal properties should be thrown open to all users on fair and equal terms so that every industry on whatever rails located shall have access to all lines radiating from that terminal, and every line carrier reaching that terminal shall similarly have access to all terminal tracks within the terminal area. As our reports show, for years access to terminals has raised questions associated with such terms as reciprocal switching, absorption of switching charges, switching of competitive traffic, favored zones, and switching of noncompetitive traffic, and with unjust discriminations and undue preferences. The unification of terminal properties everywhere should put an end to disputes of this character to the advantage alike of all railroads and all users of railroads. In the interest of efficient and economical operation and the free movement of traffic, restrictions in service and discrimination in charges which have arisen from differences in local terminal situations should cease to be a feature of railroad operation.

The cases which have been brought to our attention from time to time during past years, referred to above, show wide variations in the conditions attendant upon terminal operations in different cities. A complete survey embracing all terminals would no doubt show still greater variety than that indicated by these cases. In the face of such a great variety in circumstances and conditions, it is impracticable to prescribe in advance a universal rule for terminal railroad unification and operation. Each terminal and the properties serving it must be studied in the light of its particular facts and a practical solution worked out with due regard to the property and other rights of all owners and users. This is the duty in the first instance of the carriers serving each terminal. We expect to deal with these situations to the extent that they are connected with respective applicants when we shall have occasion to consider particular applications to consolidate, and therefore refrain from allocating in the present plan the various terminal properties not specifically mentioned herein. For present purposes they may

be treated as independent systems, subject to later grouping as shown to be in the public interest.

Under the act any plan of consolidation which may be adopted shall preserve competition as fully as possible. In order that the systems herein proposed, or any others that may be formed, may properly perform the functions intended by Congress and that competition may be preserved as required, they must be independent in fact as well as in name. The continuation or acquisition of inter-system interests directly or indirectly through holding companies, stock ownership, or otherwise, will be inconsistent with the independence necessary to true competition. Carriers will, therefore, be expected to observe this requirement in submitting proposals for consolidations and to co-operate in establishing the desired status.

In order to fully effectuate the purposes of the plan, certain trackage rights will be necessary between the systems, and we have indicated under each system the principal instances of this kind.

Wherever in this report a railway property is named, unless an exception is specifically named, it is intended to and shall be understood as including all subsidiary owned, controlled, leased, or operated lines.

We are making no suggestions regarding municipal or other publicly owned railroads. Any of such roads that desire to have us give them consideration may make representations in their own behalf in connection with applications affecting terminals or other consolidations when the same may be presented to us. For present purposes we are listing them as independent systems.

We have not specifically mentioned water carriers. Where these carriers are now controlled by carriers by rail they will be considered as being included in the systems in which the controlling rail carrier has been included.

In a matter of this magnitude in scope and complexity in detail, even after the most careful study and the fullest and freest interchange of views by those charged with the duty of preparing this plan, there must remain many differences of opinion as to the several component parts, both large and small, comprised in the final result. Such is here the case. While a clear majority of us, although not always the same majority, have agreed as to each part of the plan proposed, not all of us have agreed as to all its parts, but all concur in the result. Some of us deem it helpful now to express individual views as to parts of the plan. Others feel that their individual expressions may usefully be deferred until the time for action looking toward the ultimate effectuation of actual consolidations as provided by the act. Section 5 (5) provides that after we have adopted a plan, as we here do, we may, either upon our own motion or upon application, reopen the matter for such changes or modifications as in our judgment will promote the public interest. Such applications will afford opportunity for further consideration upon adequate and recent records of the various parts of the plan.

We find and adopt the following plan for the consolidation of railway properties of the continental United States into a limited number of systems:

System No. 1—Boston and Maine

Boston and Maine Railroad.
The Delaware and Hudson Company.
Bangor and Aroostook Railroad Company.
Maine Central Railroad Company.
The St. Johnsbury and Lake Champlain Railroad Company.
Rutland Railroad Company—O. & L. C. Division, Rouses Point to Ogdensburg.
Montpelier & Wells River Railroad.
Wilkes-Barre Connecting Railroad Company (undivided one-half interest).
Monson Railroad Company.
Kennebec Central Railroad Company.
Knox Railroad Company.
Wiscasset, Waterville & Farmington Railroad Company.
Lime Rock Railroad Company.
Hoosac Tunnel and Wilmington Railroad Company.
Suncook Valley Railroad.
Berlin Mills Railroad Company.
Middleburgh and Schoharie Rail Road.
Hardwick and Woodbury Railroad Company.
Barre and Chelsea Railroad Company.
Bridgton and Saco Railroad Company.
Sandy River and Rangeley Lake Railroad.
Boston, Revere Beach and Lynn Railroad Company.
Troy Union Railroad Company (undivided two-thirds interest).
Mt. Washington Railway Company.
The Clarendon and Pittsford Railroad Company (undivided one-half interest).
Woodstock Railway Company (undivided one-half interest).
Lake Champlain and Moriah Rail Road Company.

System No. 2—New Haven

The New York, New Haven and Hartford Railroad Company.
New York, Ontario and Western Railway Company.
The New York Connecting Rail Road Company (undivided one-half interest).
The Lehigh and Hudson River Railway Company.
Lehigh and New England Railroad Company.
Soutn Manchester Railroad Company.
Fore River Railroad Corporation.
Moshassuck Valley Railroad Company.
The Narragansett Pier Railroad Company.
Wood River Branch Railroad Company.
Grafton and Upton Railroad Company (undivided one-half interest).

System No. 3—New York Central

The New York Central Railroad Company, including:
Boston and Albany Railroad.
The Michigan Central Railroad Company.
The Cleveland, Cincinnati, Chicago and St. Louis Railroad Company.
The Cincinnati Northern Railroad Company.
The Pittsburgh and Lake Erie Railroad Company.
Evansville, Indianapolis and Terre Haute Railway Company. And:
The Virginian Railway Company.
The Ulster and Delaware Railroad Company.
Rutland Railroad Company, except O. & L. C. Division.
Boyne City, Gaylord and Alpena Railroad Company.
Bristol Railroad Company.
The Clarendon and Pittsford Railroad Company (undivided one-half interest).
Grafton and Upton Railroad Company.
Chicago, Attica and Southern Railroad Company.
The Federal Valley Railroad Company.
Fonda, Johnstown and Gloversville Railroad Company.
Glenfield and Western Railroad Company.
Grasse River Railroad Corporation.
Lake Erie, Franklin and Clarion Railroad Company.
The Lakeside and Marblehead Railroad Company.
The Lowville and Beaver River Railroad Company.
The Marcellus and Otisco Company, Inc.
Norwood and St. Lawrence Railroad Company.
Skaneateles Railroad Company.
Dexter and Northern Railroad Company.
Campbell's Creek Railroad Company.
Kelley's Creek and Northwestern Railroad Company.
Kelley's Creek Railroad Company.
The Lorain and Southern Railroad Company.
Fulton Chain Railway Company.
Cambria and Indiana Railroad Company (undivided one-third interest).
Central Indiana Railway Company (undivided one-half interest).
Cherry Tree and Dixonville Railroad Company (undivided one-half interest).
The Fairport, Painesville and Eastern Railroad Company (undivided one-third interest).
Genessee and Wyoming Railroad Company (undivided one-fifth interest).
Lake Erie and Pittsburg Railway Company (undivided one-half interest).
The Lake Terminal Railroad Company (undivided one-fourth interest).
Muncie and Western Railroad Company (undivided one-third interest).
McKeesport Connecting Railroad Company (undivided one-third interest).
Beaver Valley Railroad Company (undivided one-half interest).
Indiana Northern Railway Company (undivided one-fourth interest).
The Lake Erie and Fort Wayne Railroad Company (undivided one-third interest).
South Buffalo Railway Company (undivided one-sixth interest).
Troy Union Railroad Company (undivided one-third interest).
The Owasco River Railway.
The Monongahela Railway Company (undivided one-third interest).
Pittsburgh, Chartiers & Youghiogheny Railway Company (undivided one-half interest).
Half interest in line of Virginian between Gilbert and Mullens, W. Va.

System No. 4—Pennsylvania

The Pennsylvania Railroad Company.
The Long Island Rail Road Company.
West Jersey and Seashore Railroad Company.
Baltimore, Chesapeake and Atlantic Railway Company.
Wilkes-Barre Connecting Railroad Company (undivided one-half interest).
The New York Connecting Rail Road Company (undivided one-half interest).
The New York and Long Branch Railroad Company (undivided one-half interest).
Arcade and Attica Railroad Corporation.
Bellefonte Central Railroad Company.
Coudersport and Port Alleghany Railroad Company.
The East Broadtop Railroad and Coal Company.
Hickory Valley Railroad Company.
The Huntington and Broad Top Mountain Railroad and Coal Company.
Kane and Elk Railroad Company.
Kishkacoquillas Valley Railroad Company.
Ligonier Valley Railroad Company.
Marion Railway Corporation.
Maryland and Delaware Coast Railway Company.
The Pittsburgh, Lisbon and Western Railroad Company.
The Pittsburgh and Susquehanna Railroad Company.
Sheffield and Tionesta Railway Company.
Youngstown and Ohio River Railroad Company.
The Stewardstown Railroad Company.
Strasburg Railroad Company.
Susquehanna River and Western Railroad Company.
Tuscarora Valley Railroad Company.
The Washington, Brandywine and Point Lookout Railroad Company.
The Winfield Railroad Company.
Dents Run Railroad Company.
Donora Southern Railroad Company.
Alliquippa and Southern Railroad Company.
Chesapeake Beach Railway Company.
Pennsylvania & Atlantic Railroad Company.
Scootac Railway Company.
The Monongahela Railway Company (undivided one-third interest).
Cambria and Indiana Railroad Company (undivided one-third interest).
Central Indiana Railroad Company (undivided one-half interest).
Cherry Tree and Dixonville Railroad Company (undivided one-half interest).
Cumberland and Pennsylvania Railroad Company (undivided one-third interest).
Wilkes-Barre Connecting Railroad Company (undivided one-half interest).
Genessee and Wyoming Railroad Company (undivided one-fifth interest).
Lake Erie and Pittsburg Railway Company (undivided one-half interest).
Muncie and Western Railroad Company (undivided one-third interest).

Etna and Montrose Railroad Company (undivided one-half interest).
Johnstown & Stony Creek Rail Road (undivided one-half interest).
McKeesport Connecting Railroad Company (undivided one-third interest).
New Haven and Dunbar Railroad Company (undivided one-half interest).
Beaver Valley Railroad Company (undivided one-half interest).
Conemaugh and Black Lick Railroad Company (undivided one-half interest).
Steelton and Highspire Railroad Company (undivided one-half interest).
Indiana Northern Railway Company (undivided one-fourth interest).
Lake Erie and Fort Wayne Railroad Company (undivided one-third interest).
Patapsco and Back Rivers Railroad Company (undivided one-third interest).
Benwood and Wheeling Connecting Railway Company (undivided one-third interest).
South Buffalo Railway Company (undivided one-sixth interest).
Baltimore and Eastern Railroad Company.
The Ohio River and Western Railway Company.
Western Allegheny Railroad Company.
Pittsburgh, Chartiers & Youghiogheny Railway Company (undivided one-half interest).

System No. 5—Baltimore & Ohio

The Baltimore and Ohio Railroad Company.
Reading Company.
The Central Railroad Company of New Jersey.
Buffalo and Susquehanna Railroad Corporation.
Atlantic City Railroad Company.
The Staten Island Rapid Transit Railway Company.
Perkiomen Railroad Company.
Port Reading Railroad Company.
The Chicago and Alton Railroad Company.
Buffalo, Rochester and Pittsburgh Railway Company.
Detroit, Toledo and Ironton Railroad Company (undivided one-half interest).
The Detroit and Toledo Shore Line Railroad Company (undivided one-half interest).
Chicago, Indianapolis and Louisville Railway Company (undivided one-half interest).
Trackage rights over Western Maryland between Shippensburg, Pa., and Cherry Run, W. Va.
The Sharpsville Railroad Company.
Castleman River Railroad Company.
Chestnut Ridge Railway Company.
Cornwall Railroad Company.
The Kansas and Sidell Railroad Company.
Maryland and Pennsylvania Railroad Company.
Mount Hope Mineral Railroad Company.
Mount Jewett, Kinzue and Riterville Railroad Company.
The New York and Long Branch Railroad Company (undivided one-half interest).
Quakertown and Bethlehem Railroad Company.
Rahway Valley Company.
Raritan River Rail Road Company.
Stone Harbor Railroad Company.
The Tuckerton Railroad Company.
Philadelphia and Beach Haven Railroad Company.
The Ursina and North Fork Railway Company.
Upper Merion and Plymouth Railroad Company.
The Valley Railroad Company.
Washington Run Railroad Company.
West Virginia Northern Railroad Company.
Wharton and Northern Railroad Company.
Wildwood and Delaware Bay Short Line Railroad Company.
The Yale Short Line Railroad Company.
Preston Railroad Company.
The Buffalo Creek and Gauley Railroad Company.
Rowlesburg and Southern Railroad Company.
Strouds Creek and Muddlety Railroad Company.
West Virginia Midland Railway Company.
Winchester and Western Railroad Company.
The Brownstone and Middletown Railroad Company.
Tionesta Valley Railway Company.
The Monongahela Railway Company (undivided one-third interest).
Cambria and Indiana Railroad Company (undivided one-third interest).
Cumberland and Pennsylvania Railroad Company (undivided one-third interest).
The Fairport, Painesville and Eastern Railroad Company (undivided one-third interest).
Genessee and Wyoming Railroad Company (undivided one-fifth interest).
The Ironton Railroad Company (undivided one-half interest).
Northampton and Bath Railroad Company (undivided one-half interest).
The Lake Terminal Railroad Company (undivided one-fourth interest).
Etna and Montrose Railroad Company (undivided one-half interest).
Johnstown & Stony Creek Rail Road (undivided one-half interest).
McKeesport Connecting Railroad Company (undivided one-third interest).
New Haven and Dunbar Railroad Company (undivided one-half interest).
Conemaugh and Black Lick Railroad Company (undivided one-half interest).
Steelton and Highspire Railroad Company (undivided one-half interest).
Patapsco and Back Rivers Railroad Company (undivided one-third interest).
Benwood and Wheeling Connecting Railway Company (undivided one-third interest).
Philadelphia, Bethlehem and New England Railroad Company (undivided one-half interest).
South Buffalo Railway Company (undivided one-sixth interest).

System No. 6—Chesapeake & Ohio-Nickel Plate

The Chesapeake and Ohio Railway Company (excluding Chesapeake and Ohio Railway Company of Indiana).
The Hocking Valley Railroad Company.
Pere Marquette Railway Company.
Erie Railroad Company (including Chicago and Erie Railroad Company, New York, Susquehanna and Western Railroad Company, and New Jersey and New York Railroad Company).
The Delaware, Lackawanna and Western Railroad Company.
The New York, Chicago, and St. Louis Railroad Company.
Bessemer and Lake Erie Railroad Company.
The Pittsburgh and West Railway Company.
Chicago and Illinois Midland Railway Company.
Jacksonville and Havana Railroad Company.
Chicago, Springfield and St. Louis Railway Company.
Alton and Eastern Railroad Company.
The Detroit and Toledo Shore Line Railroad Company (undivided one-half interest).
Also the following trackage rights:
Over the Baltimore and Ohio from Dayton, Ohio, to Hamilton and Cincinnati, Ohio, and Indianapolis, Ind.
Over the Southern from Orange, Va., to Potomac Yards, Va.
Over the Cleveland, Cincinnati, Chicago, and St. Louis, and Baltimore and Ohio, from Rushville, Ind., to Louisville, Ky.
Over the Louisville and Nashville from Lexington, Ky., to Louisville.
Arcadia and Betsey River Railway Company.
The Dansville and Mount Morris Railroad Company.
Delaware Valley Railway Company.
Detroit and Mackinac Railway Company.
Detroit, Caro and Sandusky Railway Company.
East Jordan and Southern Railroad Company.
Manistee and North-Eastern Railroad Company.
Middletown and Unionville Railroad Company.
Morristown and Erie Railroad Company.
New York and Pennsylvania Railroad Company.
Port Huron and Detroit Railroad Company.
Prattsburg Railway Corporation.
Sterling Mountain Railway Company.
Unadilla Valley Railway Company.
Unity Railways Company.
West Pittston-Exeter Railroad Company.
The Kanawha Central Railway Company.
Winifrede Railroad Company.
Kanawha, Glen Jean and Eastern Railroad Company.
Ludington and Northern Railway.
The Euclid Railroad Company.
East Kentucky Southern Railway Company.
Brooksville and Ohio River Railroad Company.
Big Sandy and Kentucky River Railway Company.
Morehead and North Fork Railroad Company.
Nelson and Albemarle Railroad Company.
Virginia Central Railway.
Half interest in line of Virginian between Gilbert and Mullens, W. Va.
The Buffalo Creek Railroad Company (undivided one-half interest).
The Fairport, Painesville and Eastern Railroad Company (undivided one-third interest).
Genessee and Wyoming Railroad Company (undivided one-fifth interest).
Northampton and Bath Railroad Company (undivided one-half interest).
The Lake Terminal Railroad Company (undivided one-fourth interest).
Muncie and Western Railroad Company (undivided one-third interest).
Lake Erie and Fort Wayne Railroad Company (undivided one-third interest).
South Buffalo Railway Company (undivided one-sixth interest).

System No. 7—Wabash-Seaboard

Wabash Railroad Company.
Lehigh Valley Railroad Company.
The Wheeling and Lake Erie Railway Company.
The Pittsburgh and West Virginia Railway Company.
Western Maryland Railway Company.
The Akron, Canton and Youngstown Railway Company.
Toledo, Peoria and Western Railroad.
The Ann Arbor Railroad Company.
Chesapeake and Ohio Railway Company of Indiana.
New Jersey, Indiana and Illinois Railroad Company.
Manistique and Lake Superior Railroad Company.
Norfolk and Western Railway Company.
Seaboard Air Line Railway Company.
Detroit, Toledo and Ironton Railroad Company (undivided one-half interest).
Also the following trackage rights:
Over the Pennsylvania from Logansport to Effner, Ind.
Over the Grand Trunk Western, Ashley to Muskegon, Mich.
Over the Reading between Shippensburg and Harrisburg, Pa.
Over the Pennsylvania from Harrisburg to Rockville, Pa.
Over the Reading from Rockville to Blackwood, Pa.
Over the Reading from South Bethlehem to Philadelphia, Pa.
Over the Pennsylvania from Delphos, Ohio, to Fort Wayne, Ind.
The Chaffee Railroad Company.
East Berlin Railroad Company.
Emmitsburg Railroad Company.
Susquehanna and New York Railroad Company.
Williamsport and North Branch Railway Company.
Chesapeake Western Railway.
Valley River Railroad.
Big Sandy and Cumberland Railroad Company.
Franklin and Pittsylvania Railway Company.
Marion and Rye Valley Railway Company.
Virginia Southern Railroad Company.
Cumberland and Pennsylvania Railroad Company (undivided one-third interest).
The Buffalo Creek Railroad Company (undivided one-half interest).
Genessee and Wyoming Railroad Company (undivided one-fifth interest).
The Ironton Railroad Company (undivided one-half interest).
The Lake Terminal Railroad Company (undivided one-fourth interest).
Patapsco and Back Rivers Railroad Company (undivided one-third interest).
Benwood and Wheeling Connecting Railway Company (undivided one-third interest).
Philadelphia, Bethlehem and New England Railroad Company (undivided one-half interest).
South Buffalo Railway Company (undivided one-sixth interest).
Aberdeen and Rockfish Railroad Company.
Bennettsville and Cheraw Railroad Company.
Birmingham and Southeastern Railroad Company.
Buffalo, Union-Carolina Railroad.
Cape Fear Railways, Inc.
Cliffside Railroad Company.
Carolina and Northeastern Railroad Company.
Durham and Southern Railway Company.
Edgemoor and Manetta Railway.
Piedmont and Northern Railway Company.

The Georgia Southwestern and Gulf Railroad Company.
Greenville and Northern Railway Company.
High Point, Thomasville and Denton Railroad Company.
Lawndale Railway and Industrial Company.
Macon, Dublin and Savannah Railroad Company.
Maxton, Alma and Southbound Railroad Company.
Moore Central Railway Company.
St. Marys Railroad Company.
Atlantic and Yadkin Railway Company.
The Townsville Railroad Company.
Virginia Southern Railroad Company.
Warrenton Rail Road Company.
McRay Terminal Railway.
Tampa Northern Railroad Company.
Interstate Railroad Company (undivided one-half interest).
Chatham Terminal Company (undivided one-half interest).
Winston-Salem Southbound Railway Company (undivided one-half interest).
St. Louis and Hannibal Railroad Company.

System No. 8—Atlantic Coast Line

Atlantic Coast Line Railroad Company.
Louisville and Nashville Railroad Company.
The Nashville, Chattanooga and St. Louis Railway.
Clinchfield Railroad Company.
Atlanta, Birmingham and Coast Railroad Company.
Gulf, Mobile and Northern Railroad Company.
New Orleans Great Northern Railroad Company.
Chicago, Indianapolis and Louisville Railway Company (undivided one-fourth interest).
Winston-Salem Southbound Railway Company (undivided one-half interest).
Alabama and Western Florida Railroad Company.
Alabama, Floridan and Gulf Railroad Company.
Alcolu Railroad Company.
Apalachicola Northern Railroad Company.
Artemus-Jellico Railroad Company.
Ashland Railway Company.
Atlantic and Carolina Railroad Company.
Charleston and Western Carolina Railway Company.
Columbia, Newberry and Laurens Railroad Company.
Elberton and Eastern Railroad Company.
Live Oak, Perry and Gulf Railroad Company.
Rockingham Railroad Company.
Virginia and Carolina Southern Railroad Company.
Beaufort County Lumber Company Railroad.
Black Mountain Railway Company.
Bonhomie and Hattiesburg Southern Railroad Company.
The Carolina Southern Railway Company.
Carolina Western Railroad.
Carrolton and Worthville Railroad Company.
Chattahoochee Valley Railway Company.
East Carolina Railway.
Flemingsburg and Northern Railroad Company.
Hampton and Branchville Railroad Company.
Kentucky, Rockcastle and Cumberland Railroad Company.
Laurinburg and Southern Railroad Company.
The Mammoth Cave Railroad Company.
Manistee and Repton Railroad Company, Inc.
The Marianna and Blountstown Railroad Company.
Milstead Railroad Company.
Lakeland Railway.
Mississippi and Western Railroad Company.
Mississippi Central Railroad Company.
Mississippi Export Railroad Company.
Mountain Central Railway Company.
Nashville and Atlantic Railroad Company.
Northwestern Railroad Company of South Carolina.
Norton and Northern Railway.
Ohio and Kentucky Railway Company.
Roaring Fork Railroad Company.
Rockcastle River Railway Company.
Savannah and Atlanta Railway.
Tennessee, Alabama and Georgia Railway.
The Tuskegee Railroad Company.
Washington and Lincolnton Railroad Company.
Wilmington, Brunswick and Southern Railroad Company.
Belt Line Railway Company.
Savannah River Terminal Company.
Port St. Joe Dock and Terminal Railway Company.

System No. 9—Southern

Southern Railway Company (excluding Mobile and Ohio Railroad Co.).
Norfolk Southern Railroad Company.
Tennessee Central Railway Company (portion Nashville to Harriman).
Florida East Coast Railway Company.
Chicago, Indianapolis and Louisville Railway Company (undivided one-fourth interest).
Alabama and Northwestern Railroad Company.
Appalachian Railway Company.
Atlantic and Western Railroad Company.
Augusta Northern Railway.
Bamberg, Ehrhardt and Walterboro Railway Company.
Carolina and Northwestern Railway Company.
Dover and South Bound Railroad Company.
Due West Railway.
East Tennessee and Western North Carolina Railroad Company.
Elkin and Alleghany Railroad Company.
Frankfort and Cincinnati Railway Company.
The Gainesville and Northwestern Railroad Company.
Gainesville Midland Railway.
Georgia and Florida Railroad.
Graham County Railroad Company.
Hartwell Railway Company.
Lancaster and Chester Railway Company.
Linville River Railway Company.
The Little River Railroad Company.
Trans Florida Central Railroad Company.
The Mobile and Gulf Railroad Company.
Morgan and Fentress Railway Company.
Oneida and Western Railroad Company.
Pearl River Valley Railroad Company.
Pickens Railroad Company.
Pigeon River Railroad Company.
The South Georgia Railway Company.
Sumpter and Choctaw Railway Company.
Tennessee Railroad Company.
Tennessee North Carolina Railway Company.
Tennessee, Kentucky and Northern Railroad Company.
Tuckaseegee and Southeastern Railway Company.
Virginia Blue Ridge Railway.
Ware Shoals Railroad Company.
Cincinnati, Burnside and Cumberland River Railway Company.
Ferdinand Railroad Company.
Louisville, New Albany and Corydon Railroad Company.
Interstate Railroad Company (undivided one-half interest).

System No. 10—Illinois Central

Illinois Central Railroad Company.
Gulf and Ship Island Railroad Company.
The Yazoo and Mississippi Valley Railroad Company.
Batesville Southwestern Railroad.
Central of Georgia Railway Company.
Louisville and Wadley Railroad Company.
Sylvania Central Railway Company.
Wadley Southern Railway Company.
Wrightsville and Tennille Railroad Company.
The Minneapolis and St. Louis Railroad Company.
Tennessee Central Railway Company (Nashville to Hopkinsville).
St. Louis Southwestern Railway Company.
St. Louis Southwestern Railway Company of Texas.
Louisiana Railway and Navigation Company of Texas.
Atlanta and Saint Andrews Bay Railway Company.
Bowdon Railway Company.
Cadiz Railroad Company.
Canton and Carthage Railroad Company.
Collins and Glenville Railroad.
Fernwood, Columbia and Gulf Railroad Company.
Flint River and Northeastern Railroad Company.
The Georgia Northern Railway Company.
Garyville Northern Railroad Company.
Georgia, Asburn, Sylvester and Camilla Railway Company.
Mississippi and Skuna Valley Railroad Company.
Mississippi Southern Railroad.
The Natchez, Columbia and Mobile Railroad Company.
New Orleans, Natalbany and Natchez Railway Company.
Sandersville Railroad Company.
Shearwood Railway Company.
Smithonia and Dunlap Railroad Company.
Talbotton Railroad Company.
Kosciosko and South Eastern Rail Road Co.
Chatham Terminal Company (undivided one-half interest).
Blytheville, Leachville and Arkansas Southern Railroad Company.
Deering Southwestern Railway.
Fordyce and Princeton R. R. Co.
Gideon and North Island Railroad Company.
Jefferson and Northwestern Railway Company.
The Louisiana and North West Railway Company.
Paris and Mt. Pleasant Railroad Co.
Shreveport, Houston and Gulf Railroad Company.
Tremont and Gulf Railway Company.
The La Salle and Bureau County Railroad Company.

System No. 11—Chicago and North Western

Chicago and North Western Railway Company.
Chicago, St. Paul, Minneapolis and Omaha Railway Company.
Chicago and Eastern Illinois Railway Company.
Mobile and Ohio Railroad Company.
Columbus and Greenville Railway Company.
Lake Superior and Ishpeming Railroad Company.
Cazenovia Southern Railroad Company.
Hillsboro and North-Eastern Railway Company.
Mineral Point and Northern Railway Company.
The North and South Railway Company.
Superior and Southeastern Railway Company.
Sioux City Bridge Company.
Northwestern Coal Railway Company.
Alabama Central Railway.
Birmingham, Selma and Mobile Railroad Company.
DeKalb and Western Railroad Company.
Mississippi and Alabama Railroad Company.
Mississippi Eastern Railroad Company.
Jefferson Southwestern Railroad Company.
Litchfield and Madison Railway Company.

System No. 12—Great Northern-Northern Pacific

Great Northern Railway Company.
Northern Pacific Railway Company.
Farmers Grain and Shipping Company.
Minnesota and International Railway Company.
Gilmore and Pittsburgh Railroad Company, Ltd.
Spokane, Portland and Seattle Railway Company.
Oregon Trunk Railway.
Oregon Electric Railway Company.
United Railways Company.
Butte, Anaconda and Pacific Railway Company (undivided one-half interest).
Gales Creek and Wilson River Railroad Company.
Hartford Eastern Railway Company.
Hill City Railway Company.
Minneapolis and Rainy River Railway Company.
Minneapolis, Red Lake and Manitoba Railway Company.
Minnesota, Dakota and Western Railway Company.
Montana Western Railway Co.
Montana, Wyoming and Southern Railroad Company.
Puget Sound and Cascade Railway Company.
The Waterville Railway Company.

Washington Western Railway Company.
Camas Prairie Railroad Company (undivided one-half interest).
Cowlitz, Chehalis and Cascade Railway (undivided one-third interest).
Newaukum Valley Railroad Company (undivided one-third interest).
Craig Mountain Railway Company (undivided one-half interest).
Duluth and Northeastern Railroad Company (undivided one-half interest).
Longview, Portland and Northern Railway Company (undivided one-half interest).
Nezperce and Idaho Railroad Company (undivided one-half interest).
Oregon, California and Eastern Railway Company (undivided one-half interest).
Washington, Idaho and Montana Railway Company (undivided one-half interest).
Columbia and Cowlitz Railway Company.

System No. 13—Milwaukee

Chicago, Milwaukee, St. Paul and Pacific Railroad Company.
Chicago, Milwaukee and Gary Railway Company.
White Sulphur Springs and Yellowstone Park Railway Company.
Duluth, Missabe and Northern Railway Company.
The Duluth and Iron Range Rail Road Company.
Butte, Anaconda and Pacific Railway Company (undivided one-half interest).
Trackage rights over Spokane, Portland and Seattle Railway, from Portland, Ore., to Spokane, Wash.
Copper Range Railroad Company.
Escanaba and Lake Superior Railroad Company.
Marinette, Tomahawk and Western Railroad Company.
Midland Continental Railroad.
Port Angeles Western Railroad Company.
Port Townsend and Puget Sound Railway Company.
Ontonagon Railroad Company.
Davenport, Rock Island and North Western Railway Company (undivided one-half interest).
Cowlitz, Chehalis and Cascade Railway (undivided one-third interest).
Duluth and Northeastern Railroad Company (undivided one-half interest).
Newaukum Valley Railroad Company (undivided one-third interest).
Washington, Idaho and Montana Railway Company (undivided one-half interest).

System No. 14—Burlington

Chicago, Burlington and Quincy Railroad Company.
The Colorado and Southern Railway Company.
Fort Worth and Denver City Railroad Company.
Quincy, Omaha and Kansas City Railroad Company.
Green Bay and Western Railroad Company.
The Ahnapee and Western Railway Company.
Kewaunee, Green Bay and Western Railroad Company.
Missouri-Kansas-Texas Railroad Company.
Missouri-Kansas-Texas Railroad Company of Texas.
The Trinity and Brazos Valley Railway Company (undivided one-half interest).
Bartlett Western Railway.
Beaver, Meade and Engelwood Railroad Company.
Bevier and Southern Railroad Company.
The Colorado and Southeastern Railroad Company.
The Colorado and Wyoming Railway Company.
Eastland, Wichita Falls and Gulf Railroad Company.
The Ettrick and Northern Railroad Company.
The Galesburg and Great Eastern Railroad Company.
Hooppole, Yorktown and Tampico Railroad Company.
La Crosse and Southeastern Railway Company.
Lowell and Southern Railroad Company.
Macomb, Industry and Littleton Railway Company.
Oklahoma City-Ada-Atoka Railway Company.
Rapid City, Black Hills and Western Railroad Company.
The Roby and Northern Railroad Company.
Rock Port, Langdon and Northern Railway Company.
Shelby County Railway Company.
Shelby Northwestern Railway Company.
Tabor and Northern Railway Company.
Wyoming Railway Company.
Hannibal Connecting Railroad Company.
Winona Bridge Railway Company.
Davenport, Rock Island and North Western Railway Company (undivided one-half interest).
The Great Western Railway Company (undivided one-half interest).

System No. 15—Union Pacific

Union Pacific Railroad Company.
Los Angeles and Salt Lake Railroad Company.
Oregon Short Line Railroad Company.
Oregon-Washington Railroad and Navigation Company.
St. Joseph and Grand Island Railway Company.
The Kansas City Southern Railway Company.
The Arkansas Western Railway Company.
Texarkana and Fort Smith Railway Company.
Utah Railway Company.
Christie and Eastern Railway Company.
Great Southern Railroad Company.
Intermountain Railway Company.
Laramie, North Park and Western Railroad Company.
The Leavenworth and Topeka Railroad Company.
Leesville, Slagle and Eastern Railway Company.
The Mansfield Railway and Transportation Company.
Mount Hood Railroad Company.
Oklahoma and Rich Mountain Railroad Company.
Pacific Coast Railroad Company.
Pacific and Idaho Northern Railway Company.
Sabine and Neches Valley Railway Company.
Texas, Oklahoma and Eastern Railroad Company.
Tonopah and Tidewater Railroad Company.
Death Valley Railroad Company.
Union Railroad of Oregon.
Sumpter Valley Railway Company.
Bingham and Garfield Railway Company (undivided one-half interest).
Camas Prairie Railroad Company (undivided one-half interest).
Cowlitz, Chehalis and Cascade Railway (undivided one-third interest).
Newaukum Valley Railroad Company (undivided one-third interest).
Longview, Portland and Northern Railway Company (undivided one-half interest).
Nezperce and Idaho Railroad Company (undivided one-half interest).
Craig Mountain Railway Company (undivided one-half interest).
The Great Western Railway Company (undivided one-half interest).
The Big Creek and Telocaset Railroad Company.

System No. 16—Southern Pacific

Southern Pacific Company.
Holton Inter-Urban Railway Company.
Nevada-California-Oregon Railway.
Texas and New Orleans Railroad Company.
Northwestern Pacific Railroad Company.
San Diego and Arizona Railway Company.
Sunset Railway Company (undivided one-half interest).
Amador Central Railroad Company.
Angelina and Neches River Railroad Company.
Aransas Harbor Terminal Railway.
Arcata and Mad River Railroad Company.
Arizona Southern Railroad Company.
Bucksport and Elk River Railroad Company.
The California and Oregon Coast Railroad Company.
California Central Railroad Company.
California, Shasta and Eastern Railway Company.
California Western Railroad and Navigation Company.
Camino, Placerville and Lake Tahoe Railroad Company.
Carlton and Coast Railroad Company.
Caro Northern Railway Company.
Cement, Tolenas and Tidewater Railroad Company.
Diamond and Caldor Railway Company.
East Texas and Gulf Railway Company.
Fredericksburg and Northern Railway Company.
Groveton, Lufkin and Northern Railway Company.
Lufkin, Hemphill & Gulf Railway Company.
Louisiana Southern Railway Company.
Magma Arizona Railroad Company.
Mascot and Western Railroad Company.
McCloud River Railroad Company.
Minarets and Western Railroad Company.
Moscow, Camden and San Augustine Railroad.
Mt. Tamalpais and Muir Woods Railway.
The Nacogdoches and Southeastern Railroad Company.
Nevada Copper Belt Railroad Company.
Nevada County Narrow Gauge Railroad Company.
Oregon, Pacific and Eastern Railway Company.
Pacific Coast Railway Company.
Pajaro Valley Consolidated Railroad Company.
Peninsular Railway Company.
Port Isabel and Rio Grande Valley Railway.
Ray and Gila Valley Railroad Company.
Rio Grande Micolithic and Northern Railway.
San Joaquin and Eastern Railroad Company.
Santa Maria Valley Railroad Company.
Texas Southeastern Railroad Company.
Tonopah and Goldfield Railroad Company.
Uvalde and Northern Railway Company.
Virginia and Truckee Railway.
Trona Railway Company.
Waco, Beaumont, Trinity and Sabine Railway Company.
Tucson, Cornelia and Gila Bend Railroad Company.
Valley and Siletz Railroad Company.
Ventura County Railway Company.
Willamette Valley and Coast Railroad Company.
Yosemite Valley Railroad Company.
Bay Point and Clayton Railroad Company (undivided one-third interest).
Eureka-Nevada Railway Company (undivided one-half interest).
The Nevada Central Railroad Company (undivided one-half interest).
Nevada Northern Railway Company (undivided one-half interest).
Oregon, California and Eastern Railway Company (undivided one half interest).
Yreka Railroad Company.

System No. 17—Santa Fe

The Atchison, Topeka and Santa Fe Railway Company.
Gulf, Colorado and Santa Fe Railway Company.
Kansas City, Mexico and Orient Railway Company.
Kansas City, Mexico and Orient Railway Company of Texas.
Panhandle and Sante Fe Railway Company.
Chicago Great Western Railroad Company.
Missouri North Arkansas Railway Company.
Midland Valley Railroad Company.
The Apache Railway Company.
Arizona and Swansea Railroad Company.
The Cimarron and Northwestern Railway Company.
The Colorado-Kansas Railway Company.
The Garden City Western Railway Company.
Gulf, Texas and Western Railway Company.
Hanover Railway Company.
Manchester and Oneida Railway Company.
Minneapolis, Northfield and Southern Railway.
Minnesota Western Railroad Company.
The New Mexico Midland Railway Company.
Osage Railway Company.
Port Bolivar Iron Ore Railway Company.
The Rio Grande Eastern Railway Corporation.
Rock Island Southern Railway Co.
Santa Fe Northwestern Ry. Co.
Sierra Railway Company of California.
Verde Tunnel and Smelter Railroad Company.
Helena Southwestern Railroad Company.
Bay Point and Clayton Railroad Company (undivided one-third interest).

System No. 18—Missouri Pacific

Missouri Pacific Railroad Company.
New Orleans and Lower Coast Railroad Company.
New Orleans, Texas and Mexico Railway Company.
The Beaumont, Sour Lake and Western Railway Company.
International-Great Northern Railroad Company.
New Iberia and Northern Railroad Company.
The Orange and Northwestern Railroad Company.
East St. Louis, Brownsville and Mexico Railway Company.
San Antonio Southern Railway Company.
San Antonio, Uvalde and Gulf Railroad Company.
San Benito and Rio Grande Valley Railway Company.

Sugar Land Railway Company.
The Texas and Pacific Railway Company.
Abilene and Southern Railway Company.
Cisco and Northeastern Railway Company.
Kansas, Oklahoma and Gulf Railway Company.
Fort Smith and Western Railway Company.
The Western Pacific Railroad Company.
The Rio Grande Southern Railroad Company.
The Denver and Rio Grande Western Railroad Company.
The Denver and Salt Lake Railway Company.
Asherton and Gulf Railway Company.
Asphalt Belt Railway Company.
Houston and Brazos Valley Railroad Company.
The Orange and Northwestern Railroad Company.
Rio Grande City Railway Company.
The Denison and Pacific Suburban Railway Company.
Pecos Valley Southern Railway Company.
The Weatherford Mineral Well and Northwestern Railway Company.
Arkansas Railroad.
Arkansas Short Line.
Ashley, Drew and Northern Railway Company.
Augusta Railroad Company.
Brookings and Peach Orchard Railroad Company.
Cape Girardeau Northern Railway Company.
Carbon County Railway Company.
The Crystal River and San Juan Railroad Company.
Dardanelle and Russellville Railroad Company.
Doniphan, Kensett and Searcy Railway.
Grand Prairie-Branch Railroad Company.
Graysonia, Nashville and Ashdown Railroad Company.
Gulf and Northern Railway Company.
Indian Valley Railroad Company.
The Lake Providence, Texarkana and Western Railroad
The Manitou and Pikes Peak Railway Company.
The Midland Terminal Railway Company.
Mississippi River and Bonne Terre Railway.
Missouri-Illinois Railroad Company.
Missouri Southern Railroad Company.
Montana Railroad.
Murfreesboro-Nashville Southwestern Railway Company.
The Natchez, Urania and Ruston Railway Company.
Northeast Oklahoma Railroad Company.
Okmulgee Northern Railway Company.
Ouachita and Northwestern Railway Company.
The Prescott and Northwestern Railroad Company.
Quincy Railroad Company.
Reader Railroad.
Rio Grande and Eagle Pass Railway Company.
Roscoe, Snyder and Pacific Railway Company.
The San Luis Central Railroad Company.
The San Luis Valley Southern Railway Company.
The Silverton Northern Railroad Company.
Stockton, Terminal and Eastern Railroad.
Texas Short Line Railway Company.
Tooele Valley Railroad Company.
Trinity Valley Southern Railroad Company.
The Uintah Railway Company.
L'Anguille River Railway Company.
Trinity Valley and Northern Railway Company.
The Creek Railroad Company.
Bauxite and Northern Railway Company (undivided one-half interest).
Bay Point and Clayton Railroad Company (undivided one-third interest).
Bingham and Garfield Railway Company (undivided one-half interest).
Eureka-Nevada Railway Company (undivided one-half interest).
Nevada Northern Railroad Company (undivided one-half interest).
The Nevada Central Railroad Company (undivided one-half interest).

System No. 19—Rock Island-Frisco

The Chicago, Rock Island and Pacific Railway Company.
The Chicago, Rock Island and Gulf Railway Company.
St. Louis-San Francisco Railway Company.
St. Louis, San Francisco and Texas Railway Company.
Fort Worth and Rio Grande Railway Company.
Kuanah, Acme and Pacific Railway Company.
Alabama, Tennessee and Northern Railroad Corporation.
Louisiana and Arkansas Railway Company.
The Trinity and Brazos Valley Railway Company (undivided one-half interest).
Louisiana Railway and Navigation Company.
Alabama Central Railway.
Meridian and Bigbee River Railway Company.
Mississippi Railway.
Arkansas and Louisiana Missouri Railway Company.
Atlantic Northern Railway Company.
Burlington, Muscatine and Northwestern Railway Company.
Cairo, Truman and Southern Railroad Company.
Cassville and Exeter Railway Company.
Central Railway Company of Arkansas.
Combs, Cass and Eastern Railroad Company.
DeQueen and Eastern Railroad Company.
Texas, Oklahoma and Eastern Railroad Company.
El Dorado and Western Railway Company.
Fort Smith, Subiaco and Rock Island Railroad Company.
The Kansas and Oklahoma Railway Company.
The Louisiana and Pine Bluff Railway Company.
Manila and Southwestern Railway Company.
Miami Mineral Belt Railroad Company.
Northern Louisiana and Gulf Railway Company.
Ozark Southern Railway Company.
Poplar Bluff and Van River Railway Company.
Red River and Gulf Railroad.
The Sibley, Lake Bisteneau and Southern Railway Company.
Thornton and Alexandria Railway Company.
Wichita Falls and Southern Railroad Company.
Warren and Saline River Railroad Company.
Warren and Ouachita Valley Railway Company.
The Wichita and Northwestern Railway Company.
Oklahoma-Southwestern Railway Company.
Oklahoma Union Railway Company.
Bauxite and Northern Railway Company (undivided one-half interest).

System No. 20—Canadian National

Canadian National Railway Company lines in New England.
Central Vermont Railway Company.
Detroit, Grand Haven and Milwaukee Railway Company.
Grand Trunk Western Railway Company.
White River Road Company (of Vermont).
Woodstock Railway Company.
Indiana Northern Railway Company (undivided one-half interest).
South Buffalo Railway Company (undivided one-sixth interest).

System No. 21—Canadian Pacific

Canadian Pacific Railway Company lines in New England.
Spokane International Railway Company.
Minneapolis, St. Paul and Ste. Marie Railway Company.
Duluth, South Shore and Atlantic Railway Company.
Mineral Range Railroad Company.

Criticisms by Individual Commissioners

Some very vigorous criticisms not only of features of the plan, but also of the general policy indicated by it, are included in the minority opinions. Many of the proposals are characterized as absolutely impracticable and some as unlawful. Commissioner Eastman advocates a very conservative policy instead of "attempts to promote consolidations on a grandiose scale," and Commissioner McManamy says that railroad conditions have so improved since the war that he doubts if any one will contend that under present conditions the consolidation provisions would have become part of the law. Even under the present law, he does not believe parallel and competing lines may lawfully be consolidated. Commissioner Taylor, on the other hand goes so far as to say the commission has power to require consolidations which it believes to be in the public interest.

"The reasons for caution are greatly augmented by the fact that we are now dealing with a general railroad situation which in many respects is more satisfactory than any which has been experienced in the past," says Commissioner Eastman. "So far as service, operating efficiency in general, and ability to finance on reasonable terms are concerned, the status of the railroads has been improving rapidly and steadily during the past few years and now appears to be better than ever before. This improvement has extended to the so-called weak lines. They are far from presenting the problem which they seemed to present in 1920. And many of the lines which appear to be weak have this reputation only because of overcapitalization. There are now, it seems to me, only a very few weak lines which are really disturbing factors in the railroad situation.

"Under these circumstances I submit that there is no wisdom in experimenting with a reasonably satisfactory situation by radical attempts to promote consolidations out of hand on a grandiose scale, and that there is, on the contrary, every reason for proceeding cautiously and conservatively. I do not wish to minimize the possible benefits of consolidations or unifications. In many cases they have been beneficial in the past, and without doubt many will be in the future. But I believe that there is a present tendency, in certain quarters at least, to magnify beyond reason their possible advantages and to overlook almost entirely their possible disadvantages and dangers.

"Much depends upon the way in which they are brought about and the terms and conditions. There have been numerous instances in the past of unifications which brought disaster because of the gross extravagance and waste by which their creation was characterized.

"Such sentiment as appears to exist in favor of the consolidation of the railroads into a very few great systems is, I believe, largely artificial. According to my observation, there is very little sentiment of this kind among either shippers or railroad officers. For the most part I think that it emanates from financial circles which are likely to reap large profits from the mere process of putting the roads together. Furthermore, there

is reason to believe that the country is becoming considerably alarmed by the progress of consolidations and unifications among industries in general. It is feared that control of industry is rapidly passing into a few hands, with the danger that we shall become predominantly a nation of clerks and subordinates. Perhaps this process is inevitable in some lines of industry, and it may eventually be the fate of the railroads. But there is so much doubt about its wisdom that I see no reason for accelerating the process in the case of the railroads. There are strong grounds for belief that the best results in operating efficiency and service are secured when a railroad system is small enough so that the executive can maintain something like personal contact with the employees all down the line and also with the shippers in the territory served.

"My judgment, in short, is that we should proceed slowly in this matter and that the best consolidation plan would be one so constructed that if good reason later develops, after we have had more experience, for carrying the process of unification further, it could be done by merely combining some of the smaller systems."

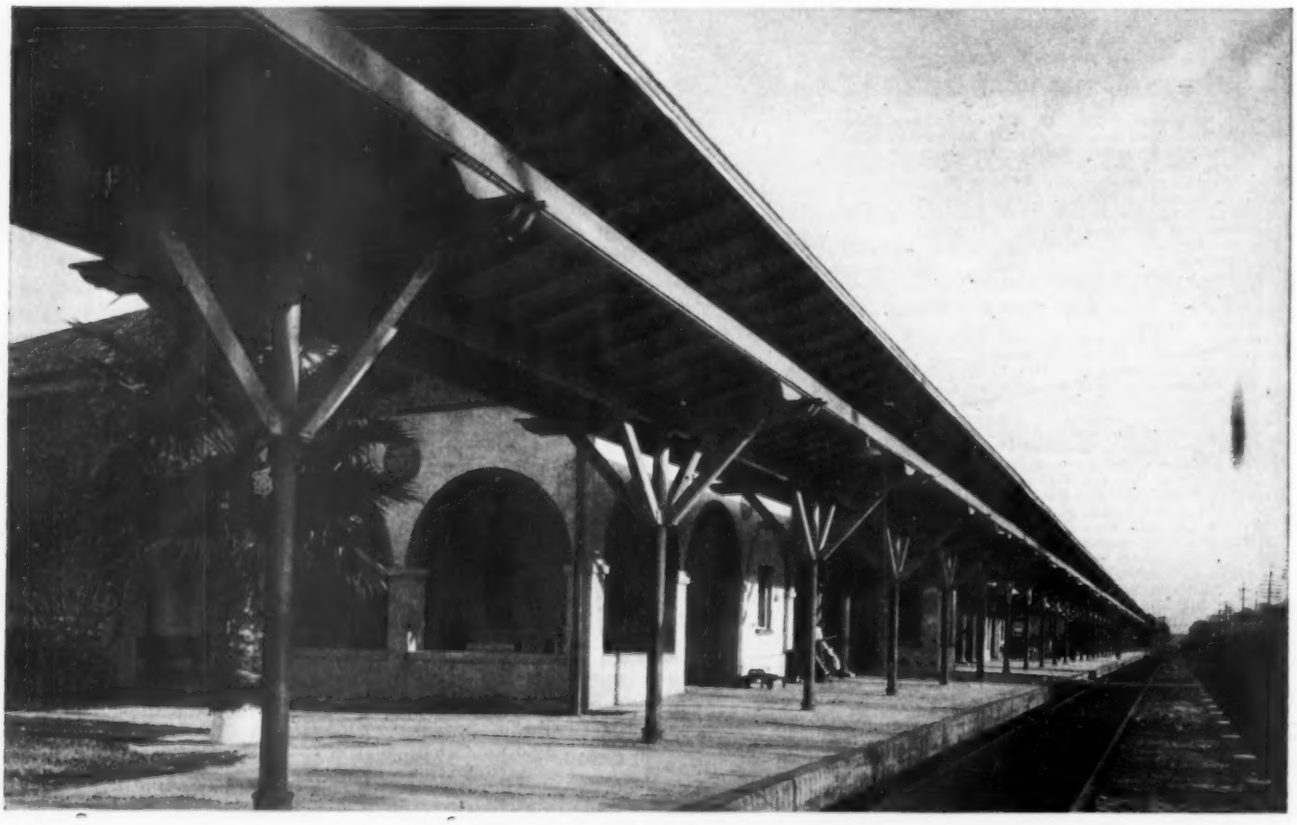
Commissioner McManamy says in part:

"Never have the railroads collectively or singly been in as good condition physically and financially as they are at present. The weak lines, that is, those which actually need help, can be counted on the fingers of one hand. Equipment is ample and our inspections show it to be in better condition than ever before and improvements are going steadily forward. Safety devices are being installed at a rate never before even considered. Orders for new material and equipment are sufficient to cover anticipated needs. There has been no car shortage for more than five years. Up to the time of the recent Wall Street debacle carloadings were making new records almost every week, not spectacular, but a steady increase. The grain crop, large as it was, moved in one month less time this year than last. Net ton-miles per mile of road per day, gross and net train-loads, gross ton-miles per train hour, net ton-miles per car day, cars per train, and other operating records by which efficiency is measured are all better than ever before recorded.

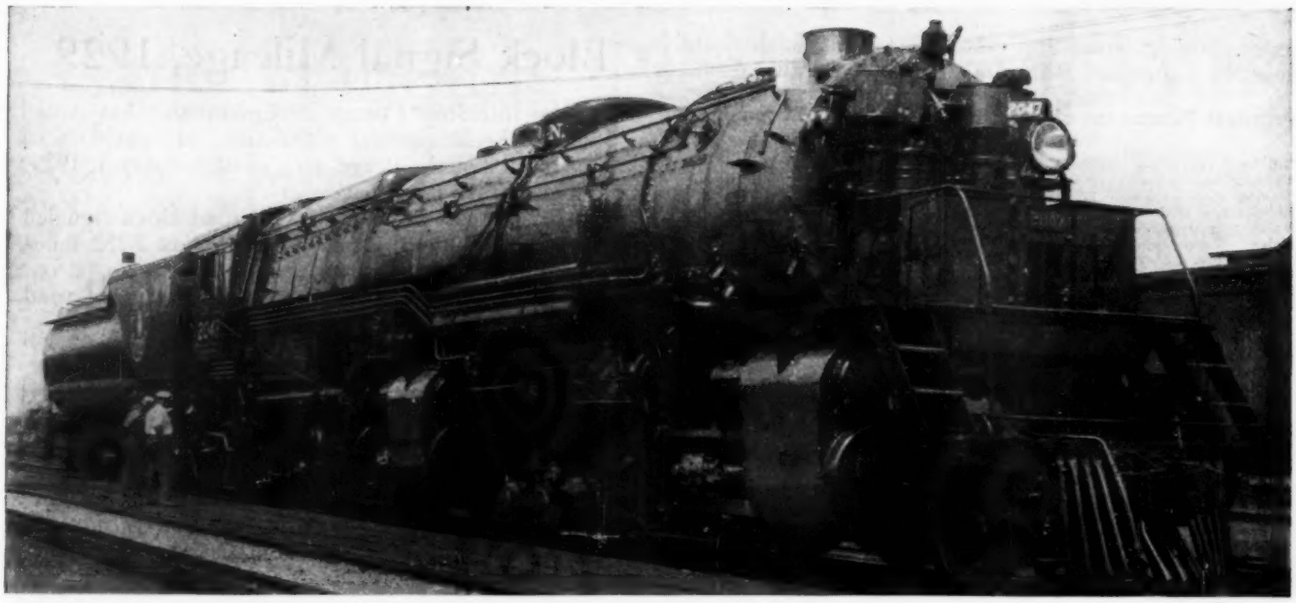
"Service to the shippers has never before been so satisfactory. Car-miles per car day are the highest on record and a new record of average speed of freight trains has just been made. Dealers are said to be carrying smaller stocks than ever before because they can renew without delay. The principal complaint shippers now have is with respect to the level of the rates, and improved service is steadily robbing that complaint of its force. In view of the conditions above described the question naturally follows, How will public interest be promoted by the creation of such huge systems as are here proposed?

"My conception of what Congress had in mind is, first that short lines should be changed from independent separate lines of railroad into branches of trunk-line systems thereby providing necessary equipment, facilities, and funds to assure continued operation of these very important and necessary parts of the transportation machine; second, that weak lines should be consolidated with stronger trunk lines thus assuring continued life and usefulness for the weak lines; and, third, that the public should have the benefit of whatever increased efficiency and economy might result from single instead of multiple line hauls. Beyond this consolidations may profit those whose chief functions are to reorganize the corporations and market the securities, but certain it is that the public will not benefit thereby."

* * * *



Florida East Coast Station at Daytona, Fla.



One of Ten Great Northern Single-Expansion Articulated Locomotives Built During 1929 at the Hillyard, Wash., Shops

Great Northern Adds to 2-8-8-2 Type Motive Power

Ten locomotives, built at the company shops, Hillyard, Wash., develop 146,000 lb. tractive force—Exceptional tender capacity provided

IN ORDER to provide additional modern freight power for service on the Rocky Mountain district between Havre and Whitefish, Mont., the Great Northern recently constructed at its shops in Hillyard, Wash., ten 2-8-8-2 type locomotives which are among the largest and most powerful steam locomotives ever built. These locomotives, known on the railroad as the R-2 class, are of the same general design as the preceding R-1 class 2-8-8-2 locomotives, used successfully on the Great Northern for the past four years, but differing from them in a number of important respects. For example, a 14.5 per cent increase in tractive force to 146,000 lb. at 65 per cent cut-off has been secured primarily by designing the boiler for 240 lb. working pressure instead of 210 lb. as used in the earlier design. Several changes in construction and general dimensions have been made in the interests of greater efficiency and the tender capacity has been increased to provide for 22,000 gal. of water and 5,800 gal of fuel oil.

The first four units of the Class R-1 articulated locomotives on the Great Northern, built in 1925 by the Baldwin Locomotive Works, carried a steam pressure of 210 lb. and developed 127,500 lb. tractive force at 65 per cent cut-off, other important characteristics and general dimensions being shown in the table. In 1928, the railroad built ten more Class R-1 locomotives, identical with the first except that heavier sheets were used in the boilers to permit carrying a steam pressure of 225 lb. and develop a tractive force of 136,600 lb.

The Class R-1 locomotives, with 210 lb. pressure have a rating of 4,200 tons eastbound from Whitefish to Walton, Mont., and actually handle 4,400 tons. The rating for the Class R-1 locomotives with 225 lb. pressure in the same district is 4,400 tons, and the actual performance, 5,000 tons. The Class R-2 locomotives, with 240 lb. pressure, however, are rated at 4,600 tons and actually handle 5,500 tons. It is said that this increased tonnage is being handled with a relatively small increase in fuel consumption, if any.

Referring to the table of comparative dimensions, it will be observed that the cylinder sizes of the two classes of locomotives have been kept the same. The provision of a slightly larger and heavier boiler has been largely instrumental in increasing the total weight of the Class R-2 locomotive to 630,750 lb., this increase being divided between the driving wheels and the trailer wheels. An increase of 45,800 lb. in tender weight brings the total weight in working order of the locomotive and tender to a figure slightly in excess of one million pounds.

The original Class R-1 articulated locomotives on the Great Northern were provided with built-up main and truck frames. The Class R-2 locomotives are equipped with Commonwealth cast-steel bed frames in two units and one-piece trailer frames. The boilers include Type E superheaters and each locomotive is fitted with an Elesco exhaust-steam injector. The boilers were built by the Puget Sound Machinery Depot Company. Finished rods were purchased from Baldwin. The wheels,

axles, driving boxes and crank pins were finished and assembled complete at the Dale Street (St. Paul, Minn.) shops and shipped to Hillyard. All the rest of the work and the assembling of the locomotives was done in the Great Northern shops at Hillyard.

Principal Dimensions of Great Northern 2-8-8-2 Locomotives

	Class R-1	Class R-2
Builder	Baldwin (1925)	Company (1929)
Type of locomotive	2-8-8-2	
Service	Freight	
Cylinders, diameter and stroke	(4) 28 in. by 32 in.	
Valve gear, type	Walschaert	
Valves, piston type, size	14 in.	
Maximum travel	6¾ in.	
Outside lap	1⅛ in.	
Exhaust clearance	None	
Lead	⅛ in.	
Weights in working order:		
On drivers	532,800 lb	544,000 lb.
On front truck	37,550 lb.	37,750 lb.
On trailing truck wheels	24,590 lb.	49,000 lb.
Total engine	594,940 lb.	630,750 lb.
Total tender	325,500 lb.	371,300 lb.
Total engine and tender	920,440 lb.	1,002,050 lb.
Wheel bases:		
Driving (rigid)	(2) 16 ft. 6 in.	
Total engine	67 ft. 1¾ in.	70 ft. 7¼ in.
Total engine and tender	96 ft. 3½ in.	106 ft. ¾ in.
Wheels, diameter outside tires:		
Driving	63 in.	
Front truck	33½ in.	
Trailing truck	33½ in.	42 in.
Journals, diameter and length:		
Driving, main	12½ in. by 16 in.	13 in. by 14 in.
Driving, others	11 in. by 14 in.	11½ in. by 14 in.
Engine truck	6½ in. by 12 in.	
Trailing truck	6½ in. by 12 in.	9 in. by 14 in.
Boiler:		
Type	Wagon Top	Belpaire
Steam pressure	210 lb.	240 lb.
Fuel, kind	Oil	
Diameter, first ring, inside	109 in.	
Firebox, length and width	144 in. by 108 in.	168 in. by 108 in.
Combustion chamber, length	.....	.....
Tubes, number and diameter	310—2¼ in.	88—2¼ in.
Flues, number and diameter	68—5½ in.	281—3½ in.
Length over tube sheets	24 ft	
Grate area	108 sq. ft.	126 sq. ft.
Heating surfaces:		
Firebox and combustion chamber	421 sq. ft.	481 sq. ft.
Arch tubes and syphons	.....	.....
Tubes and flues	6,704 sq. ft.	7,388 sq. ft.
Total evaporative	7,125 sq. ft.	7,869 sq. ft.
Superheating	1,920 sq. ft	3,515 sq. ft.
Combined evap. and superheating	9,045 sq. ft.	11,384 sq. ft.
Tender:		
Style	Vanderbilt	Water bottom
Water capacity	17,000 gal.	22,000 gal.
Fuel capacity	5,933 gal. oil	5,800 gal oil
Wheels, diameter outside tires	33 in.	
Journals, diameter and length	6½ in. by 12 in.	
Rated maximum tractive force	127,500 lb.	146,000 lb.
Weight proportions:		
Weight on drivers ÷ total weight engine, per cent	89.5	86.2
Weight on drivers ÷ tractive force	4.17	3.72
Total weight engine ÷ combined heat. surface	65.7	54.4
Boiler proportions:		
Tractive force ÷ comb. heat. surface	14.18	12.84
Tractive force × dia. drivers ÷ comb. heat. surface	890.0	810.0
Firebox heat. surface ÷ grate area	4.00	3.82
Firebox heat. surface, per cent of evap. heat. surface	6.04	4.23
Superheat. surface, per cent evap. heat. surface	26.5	44.7

YALE UNIVERSITY has announced that applications for the Strathcona Fellowships for 1930-1931 must be filed with the Dean of the Graduate School, on blanks obtainable from him, before March 1. Five Strathcona Memorial Fellowships, of $1,200 each, are offered annually for advanced work in transportation, with special reference to the construction, equipment, and operation of railroads, and other engineering problems connected with transportation, as well as the financial and legislative questions involved. Transportation by water, highways, or airways, and also other general aspects of the broad field of transportation, embracing its legal and economic phases, will be included in the subjects which may be selected for study. The holder of a Fellowship must be a man who has obtained his first degree from an institution of high standing. In making the award, preference is shown to those who have been connected with the railways of the Northwest.

Block Signal Mileage, 1929

THE Interstate Commerce Commission has issued its regular annual tabulation of statistics of block signal mileage, etc., as of January 1, 1929; a pamphlet of 17 large pages.

The net increase in length of railroad block signaled in the 12 months to January 1, 1929, was 2,252 miles, which is 88 miles more than the increase reported one year before. The aggregate totals of mileage of road, 1929 and 1928, were as follows:

	January 1, 1929	January 1, 1928
Automatic	56,488.6	53,616.5
Non-automatic	58,755.9	59,375.9
Total	115,244.5	112,992.4

The increase in automatic mileage was 2,872.1 and the decrease in non-automatic was 620 miles, making the net increase as above noted.

The bulletin gives the usual table showing the principal increases and decreases in the year 1928. These data were given at length in the *Railway Age* annual review which will be found in the issue of January 5, 1929, page 95.

The mileage of road on which automatic train control is now in operation is given in this bulletin (as of July 1, 1929) as 11,445.1 miles, of which 3,057.4 miles represent installations made voluntarily by the railroads; total number of locomotives equipped, 8,593; to which must be added 305 locomotives equipped for operation over roads other than those owning the locomotives.

The total mileage of railroad on which telephones are used in transmitting train orders was 152,901, or 3,849 miles more than on January 1, 1928.

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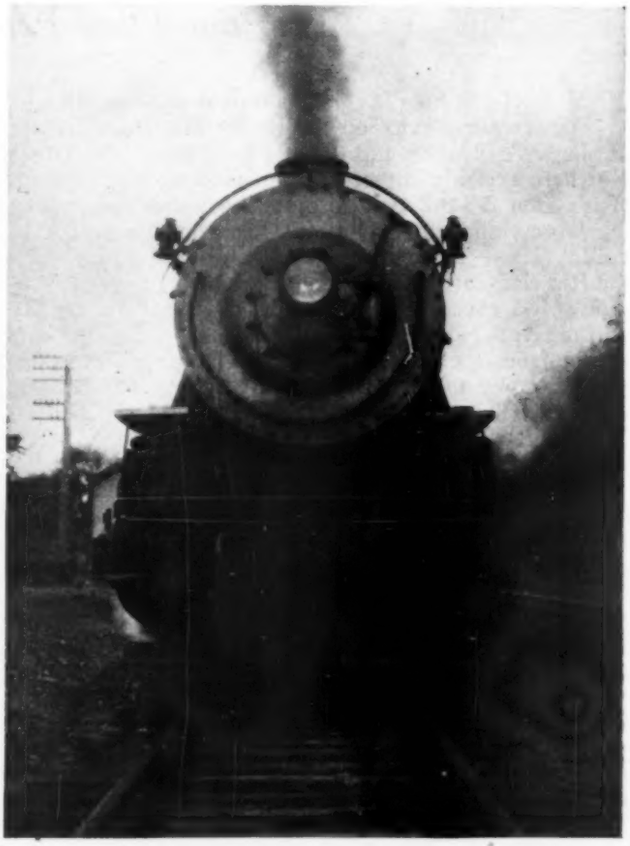


On the New York, New Haven & Hartford

Cane Handling Presents Difficulties

Texas & Pacific increases efficiency in handling Louisiana traffic

Above—Heavier Loading Is Being Attained
Left—One of the T. & P. Cane Cars

DURING the season of 1928, the Texas & Pacific handled its sugar cane crop in Louisiana with an average loading of 29 tons per car, as compared with 22 tons per car in 1923 and 21 tons per car for the 1924 crop. During the 1929 season, the tons per car have averaged 34.5, with promise of completing the season with a loading of well over 35 tons per car. The sugar cane traffic amounted to 271,965 tons in 1923, and 235,097 tons in 1928. Despite the similarity in tonnage, the 1928 crop required only 962 cars, while 1,455 cars were assigned to handle the 1923 crop. In 1929, it is expected that the crop will amount to more than 450,000 tons, and it will be handled by 1,000 assigned cars. A further saving is found in the fact, that, whereas in 1923 practically all of the cars used were foreign cars, in 1928, and again in 1929, no foreign cars are being used, thus effecting a saving of over $1,000 per day in per diem alone.

This increased efficiency has been brought about by a complete change in operating methods, by the preparation of special cars for use in hauling the cane, and by enlisting the co-operation of the shippers. The rates received for handling the sugar cane crop are considerably lower than the railway contends that they should be for the type of service rendered. The Louisiana commission, however, has consistently refused to grant an increase in the rates, which makes it vital that the cane be handled with the highest efficiency, in order to avoid a loss.

Prior to 1923, the crop amounted to between 400,000 and 500,000 tons each year. In that year, however, the cane was afflicted with a blight called the mosaic disease, and for six seasons the yield was abnormally low. A new variety of cane was then imported from Java, and this cane was first marketed in quantities in 1928, when 235,097 tons were hauled, an increase of almost 100 per cent over the previous year's crop. The new cane is of a considerably hardier variety than the native Louisiana cane and contains a higher percentage of sucrose. It is also less susceptible to cold weather, but it has one disadvantage in that it deteriorates more rapidly than the native cane. In order to avoid deterioration, it is necessary to put this new cane through the mill within 60 hours after it is cut.

The handling of the cane from the plantations to the mills of the sugar refineries is entirely local, the hauls rarely exceeding 35 miles. Accordingly, it has been the practice for years to assign cars to this service and keep them in the cane district during the entire season. Formerly, flat cars and gondolas of all ownerships were assembled prior to the shipping season and these cars were kept in this shuttle service during the entire grinding season, which normally extends from October 1 to January 1. This, of course, resulted in large charges for per diem and the fact that the cars were not specially equipped for cane handling served to keep the loading at a low figure. In the last few years, however, the Texas & Pacific has been outfitting cars of its own ownership for this service, and, this year, 1,000 such cars were available for handling the crop. These cars are T. & P. standard gondolas, 41 ft. 6 in. long, 9 ft. 6 in. wide and 54 in. high, all inside measurements. To increase their capacity, they are fitted with special cane racks, made from old flues. Each rack consists of three flues, bolted to angle iron frames and uprights, 30 in. high. Each car is equipped with four side racks, and two end racks, bolted together.

These cars are thoroughly cleaned before being placed in cane service and all foreign matter is scrubbed from their floors and sides. The air brakes are cleaned immediately prior to the season, so that the cars need not be removed from service for brake cleaning during the season. The boxes are repacked and the entire car is put in shape to run back and forth in the shuttle service throughout the season without interruption.

Loading Methods

There are 97 cane loading spurs in the Louisiana loading district, which extends from a point some 20 miles west of Melville, La., to a point 16 miles west of New Orleans, on the main line, and includes all of the branches in this territory. Cane is loaded on these spurs for shipment to 20 refineries. In some cases, the spur tracks to the loading points and to the refineries are two miles long, which adds materially to the difficulty of operation. Formerly, these tracks were kept in such shape by their owners that derailments were of frequent

occurrence. Recently, however, all of these tracks have been ballasted and put in such shape that the T. & P. locomotives may operate over them without danger.

Some of the larger plantations have tram railroads extending through their cane fields to the loading points, and in one or two instances, these tracks cross the T. & P. main line. Where this is the case, the crossings are removed after the shipping season is over. Where the tram roads are used, the cane is brought to the loading point on small flat cars, while, on the smaller plantations, carts are used. In both cases, chains are placed on the floors of the cars or carts. Each of the loading points is equipped with a derrick which picks up the cane by means of the chains and deposits it in the T. & P. cars. It is not possible to pack the cane in the cars as pressure would cause deterioration, but it is merely piled to the tops of the racks. In the last few years, greater tonnage in loading has been obtained by means of side-staking the cars with stalks of the cane itself.

The officers of the T. & P. have spent much time in securing the co-operation of the shippers and in teaching more effective loading methods. This year, the results of their efforts are beginning to be apparent. The T. & P. has also secured the co-operation of the refineries in another important respect. Up to a few years ago, the refineries bought from the cane-growers in a helter-skelter fashion. Cane would be shipped from all parts of the territory to refineries in all parts of the territory, involving much cross-haul of loaded and empty cars. This has been largely eliminated, and the refineries have been induced to buy their cane from the growers in their vicinity, in many cases exchanging contracts with other refineries. The results of this campaign are indicated in the average haul, which has shown a steady decline, as follows:

Season	Average Haul
1922	31.3 miles
1923	27.5
1924	28.8
1925	28.2
1926	29.4
1927	22.0
1928	20.3

By increasing the loading per car and reducing the average haul, the T. & P. has succeeded in adjusting the operations to a much more efficient basis. The average loading is, however, likely to be influenced by weather conditions. A severe tropical storm, occurring after the cane is ripe, twists it out of shape, and twisted cane, of course, cannot be loaded into a car in as great quantities as straight cane.

Operating Methods

The locomotives used in handling the cane crop are principally light engines, which are not used for any other purpose. Prior to the shipping season they are thoroughly overhauled and put in such shape as to avoid engine failures during the shipping season. This power is sent to the principal concentration points, Addis, Donaldsville and Bunkie, and operates from these points to the cane spurs.

The empty cane cars are also concentrated at these points at the start of the season, in accordance with crop estimates, which are carefully prepared in advance. Formerly each refinery was permitted to ask for a certain number of empty cars at the beginning of the season and these cars were then hauled to the various refineries, stencilled with the refinery's name and their distribution was handled by the refinery for the remainder of the season. With the other improved methods, however, it has been possible to modify this system. While the empty cars are still distributed on orders of the refineries as to the number of cars wanted at each cane loading track, these cars are no longer assigned to individual refineries and stencilled with their name. Instead, they are pooled and the railway distributes the empty cars to the loading tracks as may be most convenient. In this manner, cross-hauling of empty cars has been eliminated. The spotting of empty cane cars and the pulling of the loading tracks is handled by switching locals, which operate almost exclusively at night, so that the empty cars are on the loading tracks ready for loading in the morning, and the loaded cane cars are at the same time at the refineries, ready for unloading and the grinding of the cane.

The loaded cars are brought in from the spurs to the concentration points, where they are made up into trains for movement to the various refineries. Along with the loaded cane cars, these trains haul empty cars to the refineries for loading with outbound products. Similarly, a train coming to the refinery to pull out the empty cane cars, also brings back the loads of cane products to the concentration points, from which points they are handled by the through trains.

These products consist of raw sugar, granulated sugar, molasses and bagasse, the latter being the residue of the cane after it has passed through the grinding mills. This product was formerly waste, which was used only for fuel by the refineries, but in recent years a variety of uses have been found for it, such as a base in the manufacture of light building-board Most of the refineries have now installed plants for pressing this material into bales, and its use has become so general that its outbound movement amounts to about half of the inbound movement of cane to the refineries. It is expected that some 200,000 tons of this commodity will be handled by the T. & P. this year. When the bagasse is loaded immediately after being pressed into bales, box cars are supplied and the bales are trucked directly from the presses into the cars. In many cases, however, the bales are not shipped immediately, but are piled on the ground for drying. When loaded from piles, gondola cars are supplied to facilitate the handling.

Supervision Necessary

A large number of extra trainmen, enginemen, and telegraph operators are hired for the cane season. These men move from place to place, following the busy seasons on various railways, but most of them return to the T. & P. year after year for the cane shipping season.

By reason of the fact that the cane is handled largely by extra men, and the further fact that the operations are spread over such a wide area, on spur tracks at a considerable distance from the main line, the T. & P. has found it efficient to have an increased force of supervisory officers on the ground during the season. The superintendent of the Louisiana division, whose headquarters are at Alexandria, La., moves to Addis, in the heart of the cane-growing territory, and remains in the vicinity throughout the season. This is not only for purposes of supervision, but also to supply a ready means of contact between the shippers, the refineries and the railroad, since anything that has to be done during the season has to be done quickly. In addition, of course, the general superintendent, general manager, and other executive operating officers pay frequent visits to the territory. A force of trainmasters and assistant trainmasters, some of whom hold those titles only during the cane season, is assembled at strategic points, and a large number of the cane trains are ridden by these supervisors.

In general, by improved operating methods and by taking pains to secure the co-operation of the shippers, the T. & P. has brought the handling of the sugar cane to a highly efficient basis, and while, at the present rates, it will never be a large revenue-producer, it is at least not being handled with the loss that prevailed some years ago.

I. C. C. Appointment Held Up

WASHINGTON, D. C.

THE Senate seems to be much more concerned about the politics of a man nominated for appointment to the Interstate Commerce Commission than about the political make-up of the commission after its members have been appointed. Although it confirmed unanimously the reappointment of Commissioner Eastman on December 18, on the day following his nomination, and although the committee on interstate commerce had also recommended the confirmation of the new appointee, Judge Robert M. Jones, the Senate referred the latter appointment back to the committee for investigation. This was done after several Senators had complained because a Republican had been nominated to succeed a Democrat, R. V. Taylor, and because they said they had been led to believe that this was a Democratic vacancy and therefore had suggested the names of many southern Democrats to the President as candidates for the office.

Some of them also mentioned the fact that the position of Interstate Commerce Commissioner is an important one and that the question of the fitness of a nominee should be carefully considered, but it was made plain that what was bothering them was their surprise that a Republican had been selected when so many of them had expected a Democrat. However, the debate made it perfectly clear that many of the Senators did not know how many Democrats or how many Republicans had been on the commission before this appointment, although apparently some Senators were just as hazy on this point afterward.

A complication as to how the commissioners are divided between the political parties arises from the fact that Commissioner Eastman has always been listed officially as an Independent, although Senator Couzens assured the Senate that he was a Democrat and that he had voted for President Wilson and every Democratic candidate for President since. He said Eastman had repeated the statement that he had done so to the Senator during the day. Several Senators, however, said they had supposed he was a Republican and seemed to be implying that the appointment of a new Republican would be in the nature of packing the commission with too many of that political party.

Most of the discussion was on the part of Democratic Senators who had urged candidates to succeed Mr. Taylor, overlooking the fact that the last appointments made by a Republican President, Mr. Coolidge, had been to replace a Republican, John J. Esch, with a Democrat from Vermont, Patrick J. Farrell. This made the commission consist of five Republicans, Lewis, Meyer, Aitchison, Campbell and Brainerd; five Democrats, McManamy, Woodlock, Taylor, Porter and Farrell, and one Independent, Eastman. If Judge Jones is confirmed there will be six Republicans, four Democrats and Eastman.

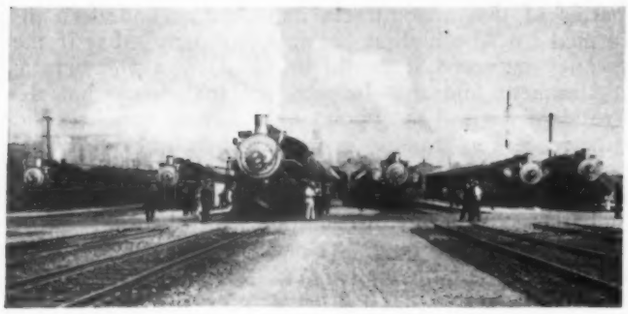
Senator Smith, of South Carolina, said he thought an injustice had been done the Democratic side in the matter of this appointment and that he had been informed by "the highest possible authority" that if the vacancy occurred it would be filled by a Democratic appointment and that he was led to believe that the President desired to appoint only a man who had had experience and training in matters pertaining to transportation. Senator Black, of Alabama, who was the first to object to immediate confirmation, also said that he had received some information which he did not care to mention on the floor "which in no way reflects upon the character of the gentleman," that he thought ought to be investigated. He also wanted to be assured that appointees to the commission should be "of such character and ability that they will see that the great masses of the people get relief from unjust and exorbitant railroad rates built up on inflated stock values."

Loud Speaker Effective in Directing Crowds

A PUBLIC address system, with loud speakers erected at strategic places along the loading platforms, was used by the Southern Pacific in directing passengers to trains following the major football games played in the Stanford University stadium at Palo Alto, Cal., during the past season. At each of two games the attendance was 90,000, and it is expected that the stadium will again be crowded to capacity on December 28 when Stanford plays the Army team from West Point.

Over its thirty-one mile steam line between San Francisco and Stadium station, the Southern Pacific carried approximately 20,000 people to each of the two principal games played on October 26 and November 23, while following these games some 17,000 people boarded sixteen special trains within the first hour and made the return trip to San Francisco in an average of approximately sixty minutes. For the game on November 23, a fleet of 29 trains of 12 cars each was required to handle the crowds returning to San Francisco. On the same day, 33 special trains were dispatched on the outbound trip. Each train left San Francisco as soon as it was loaded and the last train made the 31-mile run in 44 minutes, every passenger being given ample

The Microphone of the Public Address System Used in Directing Crowds



Six of the 33 Football Trains Waiting at Third Street Station, San Francisco

time to get comfortably seated in the stadium before the opening "kick off" of the game.

To insure having sufficient equipment to take care of this concentrated local traffic movement, the second largest ever handled on the Pacific Coast, the Southern Pacific assembled 375 passenger coaches at San Francisco and Oakland from points all over its Pacific Lines, dead-heading the cars from as far as El Paso, Tex.; Ogden, Utah; and Portland, Ore.

While the people were walking the few hundred yards from the stadium to the tracks, a traffic officer, speaking into a centrally located microphone, kept them advised as to the movements of the trains and gave them other general information that helped to eliminate the confusion that usually characterizes football crowds in the hurry to board trains.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended December 14 amounted to 923,240 cars, a decrease of 40,428 cars as compared with the corresponding week of last year but an increase of 54,490 cars as compared with 1927. Loading of coal and coke exceeded that of the corresponding week of last year, but all other classes of commodities showed a reduction and miscellaneous loading was 27,273 cars less than that for the corresponding week of 1928. All districts except the Pocahontas showed reductions as compared with last year but all except the Northwestern reported increases as compared with 1927. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, December 14, 1929

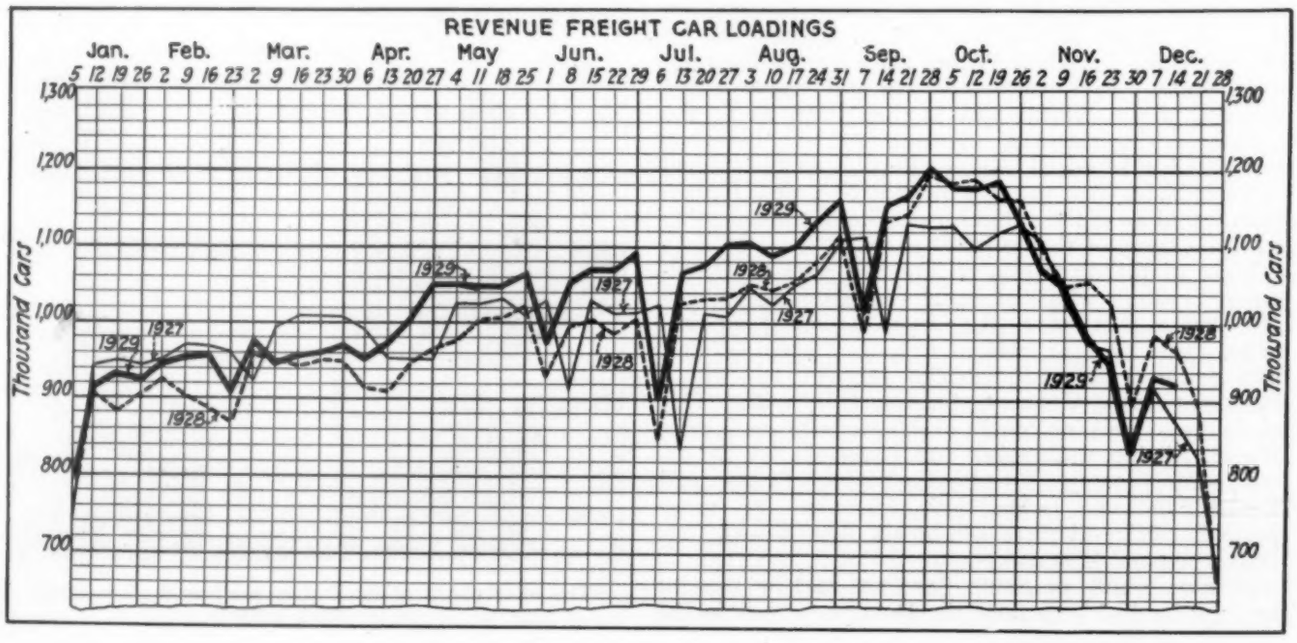
Districts	1929	1928	1927
Eastern	201,512	216,756	188,556
Allegheny	187,388	197,379	172,540
Pocahontas	60,692	57,295	47,991
Southern	143,175	152,213	141,626
Northwestern	106,147	111,597	107,537
Central Western	143,757	146,832	137,338
Southwestern	80,569	81,596	73,162
Total Western Districts	330,473	340,025	318,037
Total All Roads	923,240	963,668	868,750
Commodities			
Grain and Grain Products	43,969	51,736	44,901
Live Stock	28,908	31,665	32,294
Coal	212,732	198,520	173,274
Coke	11,664	10,925	9,973
Forest Products	52,376	61,526	53,885
Ore	8,868	10,377	9,135
Merchandise L.C.L.	245,002	251,925	246,312
Miscellaneous	319,721	346,994	298,976
December 14	923,240	963,668	868,750
December 7	936,825	984,773	877,676
November 30	837,107	900,556	918,487
November 23	950,280	1,029,237	840,642
November 16	983,323	1,056,120	968,052
Cumulative total, 50 weeks	51,? 8,861	50,021,293	50,125,442

The freight car surplus for the period ended December 8 averaged 360,247 cars, an increase of 19,507 cars as compared with the previous week. The total included 197,333 box cars, 115,227 coal cars, 25,268 stock cars and 10,989 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended December 14 totalled 57,933 cars, a decrease from the previous week of 1,588 cars, and a decrease of 12,961 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
December 14, 1929	57,933	36,577
December 7, 1929	59,521	35,141
November 30, 1929	61,413	33,560
December 15, 1928	70,894	40,510
Cumulative Totals for Canada		
December 14, 1929	3,428,468	2,024,047
December 15, 1928	3,589,206	1,977,136
December 17, 1927	3,284,791	1,860,955



Purchases and Stores Methods of European Railroads

Standards and specifications feature purchasing on London, Midland and Scottish

By N. F. Harriman

The Royal Scot Express of the London, Midland & Scottish—One of Britain's Finest Trains

DURING the past summer, the writer* spent several months in Europe, studying important railway manufacturing establishments, including their purchasing organizations and methods, and the applications of standardization and the principles of economies thereto. The London, Midland & Scottish was among the roads studied. In 1921, Parliament passed the Railway Act, under which all of the lines in England, Scotland and Wales were grouped into four major systems. This was accomplished in 1923 and the lines in Ireland were merged into one system in 1924. The London, Midland & Scottish is the result of one of these mergers. It has 7,551 miles of line, 9,871 locomotives, 291,490 freight cars and 28,044 passenger cars, dining cars, sleeping cars, etc.

The purchases of miscellaneous materials amount to approximately $32,500,000 per year. In addition, about 7,000,000 tons of coal, costing $25,000,000, are bought, while the sales of old material amount to $6,750,000. The value of the materials carried in stock at any one time is approximately $47,500,000, including coal, hotel supplies and the value of material in process of manufacture, etc.

The purchasing, custody and distribution of all materials used by this railway system, with the exception of hotel supplies, are under the jurisdiction of a chief stores superintendent. The purchases of the miscellaneous supplies are made in two ways. Items having a stable price are purchased chiefly by contract. Contracts are generally made for a period of 12 months, but the duration varies according to conditions, such as changes in market conditions. These contracts are sometimes extended because of labor disturbances, actual or anticipated, and other unusual circumstances. Commodities which are subject to considerable variations in price or use, such as tin and copper, various kinds of oils, etc., including articles required for experimental purposes, are bought by special purchase, the ratio of special purchases to contract purchases being about 50 per cent. Fuel for locomotives, etc., which is purchased in a special department under the jurisdiction of the chief stores superintendent, is chiefly covered by contracts, while scrap and obsolete materials which are also handled by a special department under the control of the chief stores superintendent, are usually disposed of by special sales.

Steps in Purchasing

The first step in a typical purchase is the receipt of a requisition from the department requiring the article. The resident storekeeper forwards the requisition, supported with details of the stock, to the general storekeeper, and the latter determines whether it is necessary to buy or whether the requisition can be filled by transferring surplus from some other place. If the demand cannot be met by transfer, the requisition is forwarded to the purchasing office.

When the kind and quality to be purchased have been determined, invitations for tenders are sent to manufacturers. These inquiries refer to specifications prepared by the technical department, standard samples exhibited at certain places, or to drawings, according to the circumstances.

The quantities shown do not of necessity represent the total quantity the company may require. Where a trade association exists and prices are likely to be identical, the firms are asked to quote on a quantity somewhat approximating that which each is likely to be awarded, in view of traffic or other circumstances. Where it is advantageous to purchase from one firm, quotations are obtained on different proportions of the total requirement to secure the benefit of lower prices offered for the larger quantities.

* Mr. Harriman is executive chairman, federal purchasing board, bureau of the budget, U. S. Government. He was once connected with the Union Pacific as engineer of tests, and is more recently known as the author of two books published during the past year, entitled "Standards and Standardization" and "The Scientific Principles of Purchasing." The present article is one of a series on foreign railroads, written by him for the *Railway Age*.

The bids are receivable on a specified date, when an abstract is prepared showing the bidders, the value of the freight secured from each firm, the price, terms and times of delivery, and other special features. The purchases are then allotted with an allowance of 10 per cent variance in quantity. It is customary to give the quantities as accurately as possible, as this is found to be beneficial to the trade and not detrimental to the company and the supply firms are able to meet the requirements in a far more commercial manner than would be the case if they had no idea as to the quantity required.

Stores Deal Direct with Firms

After the contract or special purchase of all ordinary materials has been arranged with a firm, the details are furnished the resident storekeepers, who place their orders direct with these contractors during the period of the contract for such quantities as they will require for actual use, keeping the stock at the lowest possible level.

Before shipments are accepted from contractors, the articles are inspected and tested to insure that they fulfill the specifications, drawings, etc. With some materials, such as rope, textiles, etc., it is the function of the chief stores superintendent to make the tests, while a completely organized and equipped laboratory is also maintained for the testing work. The personnel in charge of general purchasing deal with commodities rather than with amounts, and in this way the staff becomes familiar with the departments' requirements, market conditions, sources of supply, and, by reason of this experience, the office force are more or less experts in the particular commodities they handle.

Where prices vary considerably, the principle, in the main, is to buy to requirements, anticipating, so far as possible, market conditions, but avoiding the element of speculation. The purchasing department has a complete set of standard forms and purchase specifications which are written with a view to the standards of the British Engineering Standards Association, and the department is committed to the policy of keeping all transactions scrupulously fair to all parties concerned, and of maintaining the most harmonious relations with dealers, compatible with economy.

Stock Control

There are 37 main stores on the system, located for the most part in the same place as the shops they supply. These stores are divided into sub-stores, where desirable. For example, at the Crewe locomotive works, there are 61 subsection stores.

Each main store is in the charge of a resident storekeeper and is a self-contained unit. The storekeeper is responsible for keeping in touch with the shops so that the necessary articles are provided in a steady flow, and he must insure that spare parts, general utility stores, etc., are available for maintenance and general purposes.

Stocks of regularly used articles are maintained on the basis of the time required to replace the articles stocked, plus a sufficient amount to meet emergencies. Materials for building programs are, generally speaking, specially ordered when the details of the programs are forthcoming from the shops' offices.

To keep the amount of money tied up in stock as low as possible, there is a continuous and complete system of examination. The level of stock of each storekeeper is watched at headquarters to see that there is no rise without a reason, and all resident storekeepers must examine, at stated intervals, all stores under their control and report surplus and obsolete articles.

The money values of the stocks held are subjected to a check, known as a verification, by the chief accountant, and the results are submitted to the company's auditor, together with a balance sheet prepared by the chief stores superintendent. The balance sheet represents the value of the stocks for the financial purposes of the company, and the verification certifies as to the accuracy of the balance sheet figures.

The directors of the Midland form committees which meet monthly to review the performance of the railway. One of these committees receives a report each month from the chief stores superintendent. This report contains a short statement as to the state of trade, the conditions of employment in the country affecting material markets, figures as to imports and exports, a summary of the industrial situation with regard to certain commodities such as iron and steel, etc., and the trend of prices of commodities subject to considerable fluctuation. Statistics are also presented showing the value of contracts and special purchases of material and the value of sales made from one committee meeting to the next, and the cumulative results of the year. Similar information is included as to the total stocks held, the supplies issued to the various consuming units, and a record of the stores expense.

The status of the stocks of salable material and coal is also embodied in the report to the directors, together with information as to the principal contracts arranged, showing the prices paid compared with previous periods, and the firms participating, with similar information as to sales. In addition to the above, any interesting events or new developments in stores which have been adopted or are proposed are reported.

The writer is especially indebted to Sir Josiah Stamp, chairman of the board and president, and to W. A. Ree, chief stores superintendent of the London, Midland & Scottish, for the description of their purchasing and stores organization and methods.

(The remaining two articles of the series, on the Nord Railway of France, and the National Railroad of Germany, respectively, will follow in early issues of the *Railway Age*.—EDITOR.)

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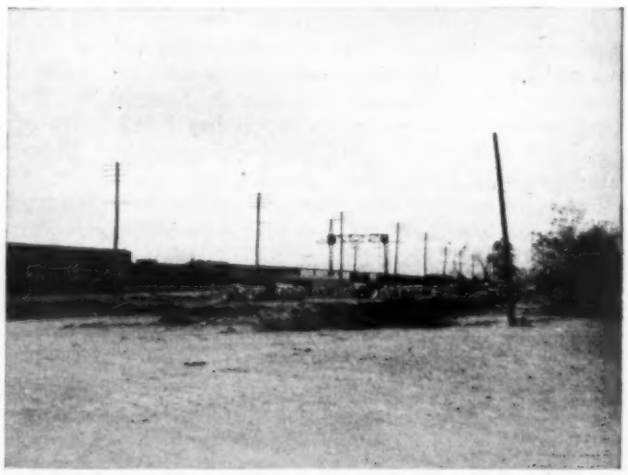

Looking West from West 110th Street, Cleveland, Ohio, Toward Linndale Yard, Where Electric Operation Is Being Substituted for Steam

The I. C. C. and Its Work

SOME of the problems faced by the Interstate Commerce Commission in its efforts to keep abreast of its work were discussed by Chairman E. I. Lewis in an address before the Indiana State Chamber of Commerce at Indianapolis, Ind., on October 15. After pointing out that the number of cases docketed with the commission increased from 1,116 in 1923 to 1,425 in 1928 or 27 per cent, and that the number of cases pending on the docket had increased from 1,982 in 1923 to 2,814 in 1928, or an increase of 42 per cent, he outlined the efforts which have been made by the commission to reduce the number of pending cases with an objective of getting the number down to 1,500 or 1,800. In 1928 the number was reduced by 108, or to 2,706 on December 31, and by August 31, this year, to 2,460, a reduction of 234, but in September there was an increase of 67. The commission is hoping, he said, to show a net drop by the close of the year to somewhere around 2,300 or 2,400.

The reductions were accomplished, Chairman Lewis said, first, by singling out the old cases, second, by an increase in the capacity of the commission for turning out more work by increasing the number of examiners and, third, by setting cases for hearing more promptly and insisting that the parties themselves consume less time with requests for postponements. Now that the Supreme Court has spoken in the O'Fallon case on the important question of valuation, it is hoped that the amount of time consumed in valuation cases may be reduced by conference agreements in the work of bringing primary valuations down to date. Chairman Lewis said in part:

In these efforts we did not overlook our own organization. We made a survey of it and took every possible step to secure greater efficiency. Already some results are manifesting themselves. We have not only freed the docket of a lot of cases that have been pending before the commission all the way from two or three years to five or six years, but we have laid a suspicious finger on every case that has a docket number below 20,000—a number on our docket reached August 15, 1927. And if you will notice you will see that we are now disposing cases in the 21,000 and 22,000 groups. Our docket number on October 11 was 22,752. The 25 new examiners will not "come into production", so to speak, until some time next year, a circumstance which makes me believe that the full momentum of our efforts will not be felt until 1930.

I want to point out one fact in justice to the commission. Let us take a case that has been on our docket for three years. Is that three-year-period chargeable to the Interstate Commerce Commission? The complaint is filed. Many of these complaints are defective. Some do not even name the parties. Others do not even state the issues. We have a small department that inspects those complaints, holds up the defectives, gets in communication with the party, or whoever initiates the action, and often helps him get it into proper form. This takes time. Adequate notice must be given for hearings. Litigation requires that parties be given time to prepare. The matter then comes on for hearing. Hearings last hours, days, weeks, sometimes months. Parties ask to be permitted to file briefs. This is a decided advantage to all parties and certainly an aid to the commission. Sixty days is the usual time; sickness or other justifiable causes require extensions. The briefs come in.

The examiner, who already has been surveying the groundwork, gets down to the final preparation of his proposed report which is served on all parties. This process of serving proposed reports has evolved. It seems to have had general approval. It puts before everyone interested not only the matter that is before the Commission, but also the recommendation of the examiner. That produces the exceptions, the concentrated statement of the controverted issues and attack on the recommendation of the examiner. Then the question is: Shall decision be further delayed for oral argument? Many submit their cases on the record they built up in the briefs and exceptions. But in many instances the parties ask for argument before the division or the commission, according to where the case lies. The case must then be set for argument. Time for it must be found on our crowded schedules. The division or Commission must then consider the case. The report must be approved or revised to meet the views of those responsible for decisions and that takes time.

So, is it any wonder that under this process, which seems to meet with general approval, 400 or 500 days elapse in the normal case, and longer time in others. Is the commission to be charged with delay when most of the time has been taken by parties? The question now is whether this procedure should be curtailed to meet the greater pressures that are, with the growth of the country and extension of our duties, coming on the commission. Are proposed reports now desirable in all cases? Should the commission be less liberal in granting oral arguments? Can hearings be shortened by better presentation?

In my efforts to reduce the docket as much as possible this year I learned a number of things that at least had never been impressed upon me before. The first was the fact that a great part of the delays was traceable to the parties themselves. Last January, I asked the chief of our section of dockets whether some time could not be saved by shortening the time between the filing of complaints and answers and the actual hearing. The conclusion of his report was that in the majority of cases the parties are not ready to proceed with the hearing when dates are fixed. He added that many assignments of cases are immediately followed by a deluge of requests for postponements of hearings.

Our attempt to speed up the whole process proved the truth of this assertion. Requests for postponements of hearings, of time for filing briefs, and of the dates for oral arguments have been numerous. One prominent railroad attorney wrote in that the commission was just about to run and work the railroad fraternity to death, adding that the recent apparent speeding up had almost passed the point of human endurance of those under the necessity of defending the cases. I had to tell him we could hold out no hope of general relief—that the commission was in dead earnest and was going ahead; that the 25 additional examiners necessarily meant more hearings, and intimated that the railroads might profit by our example by increasing their staffs to the point where they could handle the current business without working themselves to death. The same observation might likewise be made with respect to the shippers and to a relatively few persons and prominent firms, who, because of their well-known competence, have attracted to themselves a very large part of the litigation before the commission.

Mature consideration of cases submitted to it for decision is, of course, the duty of the commission. No one proposes that it should be dispensed with or that it should be substantially impaired. But prolonged deliberation can be carried too far. Justice delayed is often justice denied. If more mistakes occur by reason of the expeditious handling of cases than would otherwise happen, which is in itself a matter of a good deal of doubt, there is always the remedy of a rehearing before the commission and quite often the further remedy of review in the courts. I am firmly convinced that it is one of the paramount duties of every government department, and especially of administrative commissions, dealing with business affairs, to keep as closely abreast of its work as is humanly possible in order to reduce to the barest minimum the time that the business men of the state and the nation must have their affairs tied up in litigation.

I have spoken only of our efforts at progress in the rate field of litigation because of your more intimate knowledge and interest in that activity of the commission. While that may be well called the major purpose of our existence, still it is only a part of our many duties. It calls for an average of about five or six decisions each working day, at least during the period in which we are reducing the docket to normal. But the total activities of the commission call for an average of more than nine decisions a day. This is in the field of formal matters only. But there are literally thousands of matters informally presented and a great pressure of routine work connected with administration that makes heavy demand on our time. For illustration, during several years in which we were pressing through the three-year program for completing primary valuation, I gave more than 50 per cent of my time to administrative details of that bureau.

In closing I want to leave this report with you. We are making progress. We are getting behind some of the big

things. But the country is growing, transportation problems are increasing, and it is timely that we consider better administrative methods and practices both in the Commission and in the ranks of those who appear before us to the end that there may be relief which will afford us time to devote to consideration of the many great problems that are placed at its door.

Inter-Communicating Telephones for Trains

THE Southern Pacific Company has inaugurated a novel travel convenience in the form of inter-car telephones on its passenger train "The Cascade" operated between San Francisco, Cal., and Portland, Ore. A telephone is installed at one end of each car together with a compact switchboard, by means of which any other car on the train may be readily communicated with.

The number of a car is marked opposite each button on the switchboard and the pressing of the proper button establishes immediate connection with whatever car is desired. No other action is required in the use of the telephone and when the hand set is hung up,

Club Car Attendant Receiving Telephone Order

the board automatically clears itself. The telephones are used to arrange for maid or barber service, to order refreshments from the club car, to inquire if seats are available in the diner, to order meals in advance, etc. The telephones are located at the dining car steward's desk, at the club car attendant's station, in the ladies' lounge, in the barber shop and in all sleeping cars.

A set of 32 wires is required to provide this service on one train. Connection of wires between cars is made by a modified form of radio plug. The rumble of the train and other noises incident to its operation do not transmit themselves to the telephone line and reception is clear. Experience has shown that the telephone greatly reduces the number of trips made by passengers through the train, and does away with the need for their standing in line waiting for a seat in the diner.

The telephone system was installed under the supervision of A. W. Flanagan, superintendent of telegraph of the Southern Pacific, Pacific Lines.

Looking Backward

Fifty Years Ago

The struggle between the Atchison, Topeka & Santa Fe and the Denver & Rio Grande over the right of way through the Arkansas Valley between Canon City, Colo., and Leadville seems likely to be duplicated in the Rio Grande Valley between Santo Domingo, N. M., and El Paso, Tex. As in the case of the Grand Canyon conflict, both parties have located their lines over practically the same ground. Each party has a large engineering force in the field engaged in locating the line down the Valley in the race for El Paso.—*Railroad Gazette,* December 26, 1879.

The Boston, Hoosac Tunnel & Western [now part of the Boston & Maine] has begun the operation of trains from Mechanicville, N. Y., where it connects with the Rensselaer & Saratoga [now part of the Delaware & Hudson], to North Adams, Mass., where it reaches the Troy & Greenfield and the Hoosac Tunnel Line [both also parts of the Boston & Maine] to Boston. The road has been constructed in the face of very bitter opposition from the Troy & Boston [now part of the Boston & Maine], to which it is parallel for much of its 46 miles of length. It completes a line by which the Erie expects to secure a share of the traffic between Boston and New England and the West.—*Railroad Gazette,* December 26, 1879.

Twenty-Five Years Ago

The Supreme Court of Nebraska, in a decision rendered on December 21 in the case of the Chicago Burlington & Quincy, sustained the Nebraska law passed in 1881, forbidding railways from charging more for a short haul than for a longer haul.—*Railway Age,* December 30, 1904.

Railway building in the United States for 1904 shows a falling off of about 25 per cent compared with 1903, when 5,786 miles of new road were completed. That there would be a decrease in new mileage this year was a foregone conclusion on account of the general business situation.—*Railway Age,* December 30, 1904.

James G. Woodworth, assistant to the first vice-president of the Chicago, Burlington & Quincy, has been appointed traffic manager of the Northern Pacific, with headquarters at St. Paul, Minn. W. H. Courtenay, principal assistant engineer of the Louisville & Nashville will on January 1 become chief engineer of that road. P. E. Crowley, superintendent of the Pennsylvania division of the New York Central & Hudson River [now the New York Central], has been promoted to assistant general superintendent at Syracuse, N. Y.—*Railway Age,* December 30, 1904.

Ten Years Ago

President Wilson on December 24 issued a proclamation relinquishing the railroads and other systems of transportation from federal control effective on March 1.—*Railway Age,* December 26, 1919.

Increases in freight and passenger rates made during federal control amounted to $1,835,000,000, when applied to traffic moved up to July 31, while increases in wages applied to the number of employees and the hours worked in July, 1919, amounted to $1,774,800,000, or 97 per cent of the revenue from the increased rates, according to a statement compiled by the Interstate Commerce Commission.—*Railway Age,* December 26, 1919.

The Senate on December 20 passed by a vote of 46 to 30 the Cummins bill for the reorganization of the railroad system of the United States and of the system of railroad regulation, without having heard from the President on his intentions as to the return of the roads. The bill, together with the Esch bill passed by the House on November 20, was then sent to conference for the reconciliation of the many important differences between them. The conferees hope that they can submit a report some time in January.—*Railway Age,* December 26, 1919.

New Books

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

First Report to the Minister of Transport and the Secretary for Mines, by Standing Committee on Mineral Transport. "The general adoption of 20-ton wagons would reduce transport costs and increase the holding capacity of existing sidings; and yet despite these benefits and despite the efforts made in recent years to encourage the use of the 20-ton wagon, there are today under 26,000 20-ton wagons in use for mineral transport, or about 3 per cent of the total number of mineral wagons. Of these 26,000 only 1,700 are privately owned." p. 39. 96 p. Pub. by H. M. Stationery Office, London, England. 2 shillings.

History of Wages in the United States from Colonial Times to 1928. Bulletin No. 499 of the Bureau of Labor Statistics. Section N, "Transportation," gives the wages and hours of brakemen, conductors, locomotive engineers, locomotive firemen, by years and by states from 1840 to 1900 inclusive, with the suggestion that "similar, but not strictly comparable data for later years may be found in the reports of the United States Railroad Labor Board and the Interstate Commerce Commission, reproduced in the Monthly Labor Review of November, 1920; April, 1922; June, 1924; and February and November, 1927." (p. 429-444). 527 p. Pub. by U. S. Govt. Print. Off., Washington, D. C. 80 cents.

Holding Companies—Trial List of Material with Special Reference to the Alleghany Corporation, Chesapeake Corporation, Delaware and Hudson Company and Pennroad Corporation. 20 p. Pub. by Bureau of Railway Economics Library, Washington, D. C. *Apply.*

Railroad Purchasing and the Business Cycle, by John E. Partington. "This inquiry was undertaken principally to determine the relationship, in point of time, between railroad purchasing and the business cycle." p. 3. Discusses sources of data available, "Boom and Panic, 1870-1873," "Persistent Depression, 1874-1879," "High Prosperity and Slow Recession, 1880-1886," "Expanding Activity, 1887-1893," "Depression and Revival, 1894-1897," "Abounding Prosperity, 1898-1903," "Prosperity and Panic, 1904-1907," "Moderate Prosperity and Mild Depression, 1908-1914," "World War, 1915-1918," "Readjustment and Prosperity, 1919-1926" and "Fluctuations in Railroad Buying and Business Activity." 309 p. Pub. by Brookings Institution, Washington, D. C. $3.00.

Sources of Information for Books on Latin America, compiled by the Library of the Pan-American Union. A useful guide to Latin American periodicals containing book reviews, library and book-trade journals, and book-dealers. Arranged by countries. Notes as to procedure in obtaining material. 14 p. Pub. by Columbus Memorial Library, Pan American Union, Washington, D. C. *Apply.*

Transport Co-ordination—A study of Present-Day Transport Problems, by K. G. Fenelon. Discusses the economic characteristics of the various types of transport and their respective economic spheres, competition between road and rail transport, the economic basis of co-ordination, railways and road services in various countries, air, inland water and coasting trade co-ordination, and co-ordination of passenger transport facilities in great cities. 142 p. Pub. by P. S. King & Son, London, England, 6 shillings.

United States Supreme Court 1928-1929—A Review of the Work of the Supreme Court of the United States for October Term, 1928, by Gregory Hankin and Charlotte A. Hankin. In Chapter II "Railroad Problems," the O'Fallon case, the Lake Cargo cases, and cases involving long haul, mail rate, and orders of State commissions are discussed. Chapter IX "Railroad Labor Problems" discusses cases under Federal Employers' Liability Act. The chapter on State Taxation includes case involving the Great Northern (p. 119). 321 p. Pub. by Legal Research Service, Washington, D. C. $3.

Periodical Articles

The Attainment of Durability in Concrete Structures, by John F. Hough. Discusses what constitutes durability under various conditions and how to secure it. Engineering Journal Canada), December 1929, p. 617-625.

The Interstate Commerce Commission and Railroad Consolidation, by Sidney T. Simpson. Harvard Law Review, December 1929, p. 192-250.

The Railroads Show the Way. "[Business men] may well turn to the railroads for lessons in the fine art of keeping their fingers on more of every dollar that comes into the till." Business Week, December 18, 1929, p. 22-24.

Railway Cross Ties—Treated and Untreated, by G. P. MacLaren. "In dealing with a subject of this kind about which so much has been written by engineers and others it is intended to stress only the practice as generally adopted by the Canadian National Railways, which is a standard one on practically all of the large railways of the North American continent." p. 625. Engineering Journal (Canada), December 1929, p. 625-629.

Toward the Millennium—The Railroad Builders, by F. Britten Austin. In this series of historical high-lights of history, railroads are accorded a whole article instead of the usual brief mention. The high-light selected is the construction of the Union Pacific, concluding "Thus was accomplished the feat that was perhaps most typical of the nineteenth century, the century sundered from all predecessors by the railroad, revolutionizing the destiny of mankind as no invention had ever revolutionized it since the discovery of agriculture." Saturday Evening Post, December 14, 1929, p. 37, 39, 92-104.

Who Should Regulate the New Air Transport Facilities? by Hiram Bingham. "Why should such a lusty three-year old be taken from the arms of a parent [The Department of Commerce] who has nurtured it, shielded it, guided its footsteps, given it scientific treatment, set down rules for its discipline, and—yes, even spanked it when necessary—and turned over to such a foster bachelor uncle as the Interstate Commerce Commission, which could merely investigate its progress and write a series of 'Don'ts' for its behavior?" p. 716. Public Utilities Fortnightly, December 12, 1929, p. 716-723.

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A Well Maintained Section of Track on the Lehigh Valley

Odds and Ends of Railroading

Way Down Under

The trainmaster's office at Indio, Cal., on the Southern Pacific is probably the only one in the country situated below sea level. Just in front of the office is a neat sign, bearing the inscription: "Indio, Cal., 22 ft. below sea level."

Tongue Twisters

Easterners going west for the first time have never been known to pronounce correctly the names of the two terminal cities on one of the Southern Pacific's feeder lines in Arizona. These cities are Gila and Ajo, the first pronounced Heel-ah, and the second Ah-ho.

Unique Station

Summit, Calif., on the Southern Pacific, at an elevation of over 7,000 ft., at the top of the Sierra Nevada mountains, has a most unique station building. The station is built flush with the snow sheds, which extend for some miles on both sides of it, and, in fact, forms an integral part of one wall of the snow shed.

Another Father-Son Combination

Fathers and sons in the service of the same railroad are by no means unusual, but the Texas & Pacific has a rather unusual father-son combination. "Popper" Tucker has been agent at Strawn, Texas, for a number of years, while "Bud" Tucker, his son, has held down the same post for many years at Mingus, Texas, a few miles away, the next station to the east.

Shoofly

Of course everyone knows what a shoofly is and what it is used for, but, no one, apparently, knows just how the term originated. We have heard, from six different roadmasters, all old-timers, six different explanations of how it originated, and all of them sounded plausible. But there must be some one authentic version of the origin of the term and we should be glad if any of our readers could supply it.

Ticket Seller-Prima Donna

Mrs. Helen K. Steen, now night ticket agent for the Illinois Central at its Fifty-Ninth street suburban station, at Chicago, was at one time a stage star of considerable prominence. As Helen St. Clair, Mrs. Steen was a star and a prima donna for 18 years, during which time she appeared on stages in every state in the Union. She was leading lady for the comedian, Sidney Drew, and, upon one occasion, was billed as prima donna in Boston, Mass., for 21 consecutive weeks.

Northern Pacific Establishes A Museum

The first switch key used on the Northern Pacific system, issued in 1871 when the railroad established its first switch on its newly-started line, is one of the hundreds of treasured relics which that railway is preserving in a museum now being established in the headquarters building at St. Paul. The museum is being created by the Veterans' Association of the Northern Pacific. The association now has a membership of 1,300 persons who have records of continuous employment with the road for 30 years or more. The museum already contains articles which bring back memories of the original builders and operators of the first of the northern transcontinental lines. They date back more than a half century.

On February 15, 1870, the actual work of construction of the Northern Pacific began at a point which is now Carlton, Minn., near Duluth. The first switch was at a point where the new line joined the old St. Paul & Duluth. To Fred Sweetman was given the first switch key. He was one of the first conductors of the railway and is now living at Bridger, Mont. He held the key as a prized possession for many years, and recently turned it over to the Veterans' Association collection.

The museum is in charge of Thomas R. Sloan, secretary and treasurer of the Veterans' Association. Mr. Sloan was one of the early passenger conductors, and ran a train at the time of the completion of the Northern Pacific to the Pacific Coast in 1883. His home was at Fargo, N. D. With him in the office is M. H. McGowan, historian of the association. Together they are carrying on the task of collecting relics, pictures, records, letters and biographical sketches dealing with the early years of the railroad.

The collection contains one of the old link-and-pin car couplers which were used before airbrakes and automatic couplers became standard equipment. A piece of the tie in which the gold spike was driven, marking the completion

T. R. Sloan and M. H. McGowan Examining the Relics

of the "first of the northern transcontinentals" at Gold Creek, Mont., in 1883, is another relic. The gold spike, despite diligent search, is classed as "missing". The silver spike, however, which was driven when the line entered Montana in 1879, has found its place in the collection. One of the more recent articles which is preserved is the maul which President Charles Donnelly used in driving the last spike on the Glendive-Circle-Brockway line in 1928. It is from the end of this line that the Northern Pacific now has asked authorization from the Interstate Commerce Commission to build westward to Lewistown, Mont.

More than 100 early day pictures of individuals and railway equipment and property are on file in the association's offices. Mr. McGowan, as historian, has collected and compiled the biographies of 500 members of the association and is in correspondence with the 800 other members, seeking to obtain their biographies.

The entire Northern Pacific is being scanned for material with which to enlarge the collection of relics. Letters have gone out to employees in all departments to co-operate in bringing material to the museum. What is believed to be the desk used by Henry Villard, who was president of the Northern Pacific when the line was completed to the Pacific Coast in 1883 has been located in a master mechanic's office at Missoula, Mont. Officers of the association say that if its authenticity is established, the desk will become a relic in the museum.

NEWS of the WEEK

The West Shore Yards, Weehawken, N. J.

THE TEMPORARY INJUNCTION restraining former employees of the Toledo, Peoria & Western from interfering with operation of trains was continued for a period of 10 days on December 14 by United States District Judge Louis Fitzhenry. Union employees of the road, with the exception of members of the Brotherhood of Locomotive Engineers, went on strike on November 13.

THE PENNSYLVANIA announces that the Union continuous cab signal system already nearly completed on the line from New York to Washington and on certain other sections has been authorized for installation on the Pittsburgh division from Altoona to Pittsburgh, 113 miles. The main line of this division is mostly four track and 400 locomotives will have to be equipped.

THE NOMINATING COMMITTEE of the American Railway Engineering Association has made the following nominations for officers, ballots being issued to the members on January 1: President, G. D. Brooke, general manager of the Chesapeake & Ohio; vice-president, J. V. Neubert, chief engineer, maintenance of way, of the New York Central; secretary, E. H. Fritch, vice-president of the Chicago, Rock Island & Pacific; and treasurer, A. F. Blaess, chief engineer of the Illinois Central.

JULIUS H. BARNES, chairman of the National Business Survey Conference, held in Washington on December 5 to consider ways of maintaining the national business momentum, has appointed a business survey conference committee of over one hundred business executives, supplementing the executive committee recently appointed. The names include those of R. H. Aishton, president of the American Railway Association, and Alba B. Johnson, president of the Railway Business Association.

Central Railway Club Dinner

Charles E. Smith, vice-president of the New York, New Haven & Hartford will speak on "Railroading, A Matter of Men, Materials and Methods," at the forty-first annual dinner of the Central Railway Club of Buffalo, which will be held on Thursday evening, January 9, 1930, at the Hotel Statler. Members of the club in New York City are planning on going to Buffalo in special cars, or a special train, over the New York Central, leaving New York on Wednesday evening and acting as an escort for Mr. Smith. Ross Hayes has been selected as chairman of the New York delegation.

Commerce Department Praises Railway Service

The quality of service furnished by the railways of America, as well as by other public carriers, "is better now than at any other time in the history of the country," says the annual report of the Secretary of Commerce to the President.

"Shortages of cars have now become rare occurrences. At present it takes scarcely two-thirds as long to move goods a given distance as it did a decade ago. With the increasing efficiency with which traffic is being handled, producers are able to make quicker deliveries and distributors are able to carry smaller stocks and to turn over their capital more quickly. As a result goods are cheapened to consumers."

Portes Gil Rules on Mexican Strike; Operation Resumed

Train service was resumed on the Mexican Railway on December 19 after all employees of the road had been out on strike since December 6. The president of the Republic, Portes Gil, to whom the controversy between the management and the employees had been referred, handed down a decision on December 18 in which he directed that the strikers must return to work and that the road must effect collective labor contracts with the employees within 45 days. One of the principal provisions of the collective contracts will be that the railroad must select extra workers from lists submitted by the unions. President Gil also ruled that the railway must pay the wages of the strikers for the period of 13 days in which the strike was in effect.

McManamy Elected Chairman of I. C. C.

Pursuant to the policy adopted in 1911, Commissioner Frank McManamy has been elected chairman of the Interstate Commerce Commission, effective January 1, 1930, for the ensuing year, succeeding E. I. Lewis. Mr. McManamy began with the commission 23 years ago, and with the exception of five years with the United States Railroad Administration, he has been constantly in the employ of the commission.

While with the United States Railroad Administration as assistant director of operation he was in charge of the construction and maintenance of the equipment on all railroads during federal control. After federal control he spent three years in charge of the settlement of claims against the government arising out of the use of railway equipment by the government and its condition when returned to the railroad companies. Prior to entering the service of the commission he was for many years a railroad employee, therefore has a practical knowledge of railroad operation. He is a member of various organizations of railroad employees and officers including Division 5 of the American Railway Association and the American Society of Mechanical Engineers. He was first appointed commissioner by President Harding in 1923 and was reappointed by President Coolidge.

E. W. Beatty Optimistic

"Railway conditions as they exist in Canada today are readily comprehensible, and we are in the fortunate position of being able to assure our shareholders that the decreases represent the result of an extraordinary combination of conditions, and that the railways have not failed in efficiency or otherwise," stated E. W. Beatty, chairman and president of the Canadian Pacific, in an address in Toronto last week, at the annual meeting of the Commercial Travelers' Association of Canada.

"It is not, however," continued Mr. Beatty, "a condition which gives us much ground for apprehension, because we are able to consider the situation in 1929 as exceptional, and not likely to be repeated in subsequent years. If a serious agricultural depression had taken place five years ago and had been accompanied by a small movement of crop to the markets of the world, the situation would have materially, at least, been more serious, but Canada has in the last few years made great progress, it has the background of four successive crops, great in volume or in monetary value, and the diversification of its development has been so pronounced that neither its present position nor its future prospects are seriously prejudiced by the conditions of which I speak."

Consolidation Legislation Discussed

The promulgation of the Interstate Commerce Commission's consolidation plan has revived some interest in Congress in the subject of proposed legislation to perfect the consolidation provisions of the present law, which reached the stage of committee reports in both the House and the Senate at the last session, now represented by the Fess bill in the Senate and the Parker bill in the House. First discussion of the plan in Congress and in statements to the press by members of Congress seemed to indicate that they had an impression that the commission plan was something to be made effective by itself and queries were raised as to whether the commission had power to put its plan into effect. There was also some criticism of the plan on the basis of such an impression and also discussion as to whether the commission should be given power to require consolidation.

The primary purpose of the pending bills was to repeal the requirement of a complete commission plan as a prerequisite to any consolidations, but they also contain many provisions designed to provide more workable methods of obtaining authorization by the commission for specific plans voluntarily proposed by railroads. In view of the failure of Congress to repeal the plan provision the commission has now complied with that part of the law but those interested in seeing consolidations brought about still feel the need of the passage of the bills.

Representative Parker said that he would inquire of the commission whether it is of the opinion that any changes are necessary in his bill, particularly in relation to holding companies. Senator Couzens, chairman of the Senate committee on interstate commerce, has indicated his intention of offering an amendment to the Fess bill to give the commission authority to deal with holding companies, but he is anxious to complete consideration of his communications bill before taking up the railroad bill. The House committee also proposes first to take up the subject of bus regulation. Senator Fess indicated a belief that the publication of the plan makes necessary no change in his bill although he thought something might be added to cover holding companies.

Carrollton Viaduct 100 Years Old

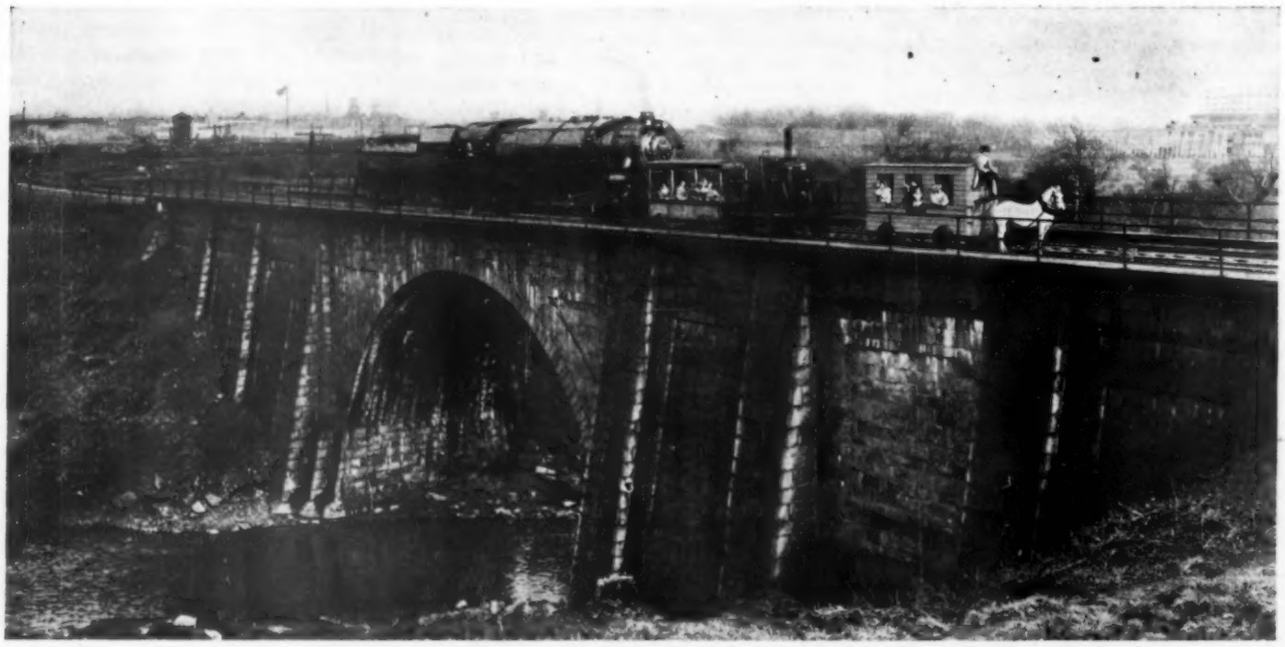
The stone arch bridge over Gwynn's Falls on the Baltimore & Ohio Railroad, in Baltimore, is 100 years old, having been put in use on December 21, 1829; and the event was marked on Thursday of last week by a miniature pageant, as shown in the illustration. The horse car represents the one which figured so largely in the opening of the Baltimore & Ohio, in 1830, and the locomotive is the Tom Thumb. In contrast with these ancient vehicles is the Lord Baltimore, heaviest passenger locomotive. The ladies in the old cars are employees of the Baltimore & Ohio, and are dressed in the costumes of 1830. Seated in the locomotive is C. W. Galloway, vice-president in charge of maintenance and operation, whose grandfather, William Galloway, was a driver on the first horse car of the Baltimore & Ohio. With Mr. Galloway is a grandson, William Dickey, Jr., representing the fifth generation from William Galloway.

This bridge is on the Mount Clare branch, in the southwestern part of the city of Baltimore The span of the arch is 80 ft. and the bridge is 70 ft. high. The name "Carroll" is in memory of Charles Carroll, of Carrollton, who was the last surviving signer of the Declaration of Independence and whose name is familiar to the reader in connection with the opening of the Baltimore & Ohio. This bridge is said to be the oldest stone arch railroad bridge in the world.

The Bureau of Safety

The Bureau of Safety, of the Interstate Commerce Commission, the functions of which were begun on a small scale in 1893, when safety appliance laws began first to be an important feature of the Commission's work, has expanded until today it is an establishment employing a director, two assistant directors, three section chiefs, with clerical assistants, and 79 persons in the field force. These and other facts concerning the growth of the bureau are to be found in an article by W. P. Borland, the director of this department, published in the United States Daily (Washington).

The laws under which the Bureau acts deal with safety appliances on cars and locomotives; hours of duty of trainmen and telegraphers; investigation of accidents, investigation of new devices, and automatic train control. The field organization consists of 58 inspectors of safety appliances, 13 on hours-of-service, six



Carrollton Viaduct, Baltimore & Ohio, Baltimore, Maryland

signal and electrical engineers, one mechanical engineer and one engineer-physicist.

Showing the value of the safety appliance laws, Mr. Borland cites the statistics of 1890 compared with those of 1928. In coupling and uncoupling cars, the reduction has been from 369 killed and 7,842 injured to 37 killed and 1,135 injured; and the number of men exposed has more than doubled. Killed by falling from the tops of trains in 1890 numbered 347, and the injured 513. This classification is no longer used in the accident records, but the saving in life and limb since 1890, largely because of the adoption of the air brake, is shown by the report for 1928, in which year 45 men were killed and 521 injured by coming in contact with overhead and side obstructions.

The railroads send to the commission telegraphic reports of all fatal accidents to passengers and employees while on or about trains, and inspectors are sent to inquire into cases which are believed of sufficient consequence to warrant federal investigation. Reports of investigations are sent to the railroads involved and are made public. The commission has no authority to require correction of bad practices disclosed, but the publicity has been effective in causing corrective measures to be taken. Facts brought out in the investigation of train accidents have led to the governmental requirement of automatic train control and to an extensive investigation of air brake practice.

The reports of the commission's engineers on installations of automatic train control and annual reports of progress in the installation of block signals and interlocking constitute an important element of the bureau's work.

Blizzard Ties Up Chicago Terminal

A two-day blizzard, on December 18 and 19, produced one of the worst tie-ups in years in the Chicago terminals. Within 40 hours 14.8 in. of snow fell, the second largest precipitation in Chicago's history. This snowfall was accompanied by an extremely high wind. Despite the fact that one of the largest emergency snow-fighting forces ever employed by the railways was put into action almost at once, the wind continued to form drifts and pack switch points with snow faster than it could be cleared away.

While all approaches to the city suffered, perhaps the hardest hit was the stretch of tracks between Englewood and the La Salle Street Station, 6.7 miles, used by the New York Central, the Chicago, Rock Island & Pacific, and the New York, Chicago & St. Louis. To relieve the situation, the N. Y. C. suspended its suburban service entirely for two days, while the Rock Island suburban service was operated only sporadically on the evening of December 19 and the morning of December 20. It was necessary to stop some of the inbound trains at Englewood, because of congestion north of that point. In a number of instances, the cars of N. Y. C. limited trains were sent eastbound without being turned. Despite these efforts, the through trains suffered delays, attributable principally to the congested terminal situation brought about by the packed snow clogging switches All trains entering the station were more or less delayed, for two days, but the situation was particularly acute during the worst of the storm, on December 19, when the fourth section of the Twentieth Century Limited, westbound, was more than seven hours late, about half of this delay being experienced within 30 miles of Chicago. On the same day, the second section of the Century, eastbound, was over six hours late at Toledo, Ohio. These delays are indicative of the conditions existing. The situation was materially improved on December 20, although trains were still running late. Approximately normal conditions were approached on December 21, and, despite another storm which began on the 22nd, and continued for several hours, all N. Y. C. through trains were on time on the morning of the 23d.

Trains entering the Union Station were also delayed by terminal and road conditions, the Pennsylvania reporting on December 19 that its line was covered with from 10 to 14 in. of snow for 300 miles east of Chicago. For two days, through trains, including the Broadway Limited, were from one to four hours late, both eastbound and westbound. Trains of the other roads, the Chicago, Burlington & Quincy, the Chicago & Alton, and the Chicago, Milwaukee, St. Paul & Pacific, using the Union Station, were also delayed. The Burlington suburban trains were running from one to two hours late on December 19.

Trains of the Baltimore & Ohio, the Chicago Great Western, the Pere Marquette and the Soo Line, all of which enter the Grand Central station, were delayed, the Capitol Limited of the B. & O., being about four hours late on December 20.

The Chicago & North Western was compelled to suspend its suburban schedules on December 19. However, special trains were operated throughout the day, so that the maximum delay to any of the commuters was about an hour. The difficulty was all encountered within a few miles of the station, where the interlocking plants were sporadically inoperative.

Because of inability to operate the station interlocking plant for several hours, trains using the Dearborn station were compelled to discharge passengers about two blocks from the station. There was, however, relatively little delay to the through trains using the Dearborn station.

Owing to switches being snowed under and frozen, and the slower movement of trains on the road because of snow, all inbound trains normally using the Central station were stopped and passengers discharged at Fifty-Third street, six miles out, and Kensington, 12 miles out, for 47 hours, beginning at 7 am., December 20. Altogether 80 inbound trains of the Illinois Central, Michigan Central, Big Four and Chesapeake & Ohio were seriously delayed. The passengers were transferred to the electric suburban trains, special red-cap service being provided. About three-fourths of the trains were stopped at Fifty-Third street, the other fourth at Kensington. While there were some delays, the electric suburban service of the I. C. was operated within half an hour of schedule during the worst of the storm, returning to normal shortly thereafter.

The entire situation was complicated by an unusually heavy holiday traffic, and by the almost complete breakdown of highway transportation during the storm.

Meetings and Conventions

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 5605, Grand Central Terminal Building, New York City. Next meeting, May 13-16, 1930, Stevens Hotel, Chicago. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Fred W. Venton, Crane Company, 836 So. Michigan Blvd., Chicago. Meets with Air Brake Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—J. D. Gowin, 112 W. Adams St., Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago. Next meeting, April, 1930. Daytona Beach, Fla.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next convention, June 16-19, 1930, Minneapolis, Minn.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, Supt. Dining Car Service, Monon Route, Chicago.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York. Annual Convention, June 21-25, 1930, San Francisco, Cal.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPE FITTERS' ASSOCIATION.—C Borchert, 202 North Hamlin Ave., Chicago.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.

Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section.—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York.

Protective Section.—J. C. Caviston, 30 Vesey St., New York.

Safety Section.—J. C. Caviston, 30 Vesey St., New York.

Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York. Next convention, Sept. 16-19, 1930, Royal York Hotel, Toronto, Ont.

Division II.—Transportation.—G. W. Covert, 431 South Dearborn St., Chicago.

Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.

Division IV.—Engineering.—E. H. Fritch, 431 South Dearborn St., Chicago. Next meeting, March 11-13, 1930, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section.—E. H. Fritch. Next meeting, March 11-13, 1930, Palmer House, Chicago.

Electrical Section.—E. H. Fritch.

Signal Section.—H. S. Balliet, 30 Vesey St., New York. Next meeting, March 10-11, 1930, Stevens Hotel, Chicago.

Division V.—Mechanical.—V. R. Hawthorne, 431 South Dearborn St., Chicago. Annual convention, June 18-25, 1930, new Auditorium, Atlantic City, N. J. Exhibit by Railway Supply Manufacturers' Association.

Equipment Painting Section.—V. R. Hawthorne, 431 South Dearborn St., Chicago, Next convention, 1930, Chicago. Exhibit by Supply Men's Association.

Division VI.—Purchases and Stores.—W. J. Farrel, 30 Vesey St., New York, N. Y. Annual convention, June 18-20, 1930, Convention Hall, Atlantic City.

Division VII.—Freight Claims.—Lewis Pitcher, 431 South Dearborn St., Chicago. Next meeting, June 10-13, 1930, Olympic Hotel, Seattle, Wash.

Division VIII.—Motor Transport.—George M. Campbell, American Railway Association, 30 Vesey St., New York, N. Y.

Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Annual convention, October, 1930, Louisville, Ky. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—E. L. Taylor, Asst. to Exec., Vice-Pres., N. Y., N. H. & H., New Haven, Conn. Annual meeting, June 18-20, Hotel Duluth, Duluth, Minn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association, Division IV.—E. H. Fritch, 431 South Dearborn St., Chicago. Annual meeting, March 11-13, 1930, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MAGAZINE EDITORS ASSOCIATION.—Miss Page Nelson Price, Norfolk & Western Magazine, Roanoke, Va.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C., M., St., P. & P. R. R., 11402 Calumet Ave., Chicago. Annual convention, May, 1930, Chicago. Exhibit by Supply Association of the American Railway Tool Foreman's Association.—Acting Secretary: H. W. Leighton, Harry W. Leighton Co., 565 W. Washington St., Chicago.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Paul D. Mallay, Johns-Manville Corp., 292 Madison Ave., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 228 N. LaSalle St., Chicago. Annual convention, January 28-30, 1930, Olympic Hotel, Seattle, Wash.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual convention, May 21-23, 1930, Richmond, Va.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 413, C. & N. W., Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, 17th and H Sts., N. W., Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—J. W. Fogg, MacLean-Fogg Lock Nut Co., 2649 N. Kildar Ave., Chicago. Meets with International Railway General Foremen's Association.

BOILER MAKER'S SUPPLY MEN'S ASSOCIATION.—George R. Boyce, A. M. Castle & Co., Chicago. Meets with Master Boiler Makers' Association.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—I. B. Tanner, Joe E. Nelson & Sons, 3240 So. Michigan Ave., Chicago. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 129 Charon St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, Chicago & Alton, Chicago. Regular meetings, 2nd Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, 514 East Eighth St., Los Angeles, Calif. Regular meetings, second Friday of each month, 514 East Eighth St., Los Angeles.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—F. G. Wiegmann, 720 N. 23rd St., East St. Louis, Ill. Meetings first Tuesday of each month, except July and August, Broadview Hotel, East St. Louis, Ill.

CENTRAL RAILWAY CLUB.—E. F. Ryan (President), Buffalo, Rochester & Pittsburgh Ry., Buffalo, N. Y. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—(See Master Car Builders' and Supervisors' Association.)

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 811 Union Central Bldg., Cincinnati, Ohio. Meetings, 2nd Tuesday in February, May, September and November.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, first Monday each month, except July, August, September, Hotel Hollenden, Cleveland.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Annual meeting, September, 1930, Hotel Sherman, Chicago. Exhibit of International Railroad Master Blacksmith's Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—J. H. Jones, Crucible Steel Company of America, Pittsburgh, Pa.

INTERNATIONAL RAILWAY CONGRESS.—Madrid Spain, May 5--15, 1930.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. T. Winkless, Room 700, La Salle Street Station, Chicago. Next meeting, May 6-9, 1930, Hotel Sherman, Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—L. R. Fyle, Locomotive Firebox Co., Chicago. Meets with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—A. F. Stiglmeier, New York Central, 29 Parkwood St., Albany, N. Y. Annual meeting, May 21-24, 1930, William Penn Hotel, Pittsburgh, Pa. Exhibit by Boiler Maker's Supply Men's Association.

MASTER CAR BUILDERS' AND SUPERVISORS' ASSOCIATION.—A. S. Sternberg, Belt Ry. of Chicago, Polk and Dearborn Sts., Chicago. Exhibit by Supply Men's Association.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—Roy. M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 1014 South Michigan Ave., Chicago. Exhibit at A. R. E. A. convention.

NATIONAL SAFETY COUNCIL.—Steam Railroad Section: A. W. Smallen, C., M., St. P. & P., Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, excepting June, July, August and September, Copley-Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—E. Sumner (President), Asst. to Gen. Supt. M. P. Penna. R. R., Philadelphia, Pa. Regular meetings, 3rd Friday in month, except June, July and August.

PACIFIC RAILWAY CLUB.—W. S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings 2nd Tuesday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—F. R. Woodson, 1116 Woodward Building, Washington, D. C. Annual convention, April 30-May 2, 1930, Hotel Roosevelt, New Orleans.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 1406 Packard Bldg., Philadelphia, Pa.

RAILWAY CAR DEPARTMENT OFFICERS' ASSOCIATION.—(See Master Car Builders' and Supervisors' Association.)

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—F. W. Venton, Crane Co., 836 S. Michigan Ave., Chicago. Meets with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division and Purchases and Stores Division, American Railway Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division 1.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Exhibit by Track Supply Association. Next meeting, September 16-18, 1930, Hotel Sherman, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A. Signal Section.

SOUTHEASTERN CARMEN'S INTERCHANGE ASSOCIATION.—Clyde Kimball, Inman Shops, Atlanta, Ga. Meet semi-annually.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, June, September and November, Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & A. Ry., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville Varnish Co., Louisville, Ky. Meets with A. R. A. Div. V. Equipment Painting Section.

SUPPLY MEN'S ASSOCIATION.—Bradley S. Johnson, W. H. Miner, Inc., Chicago. Meets with Master Car Builders' and Supervisors' Association.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., 80 E. Jackson Blvd., Chicago. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, O. Annual meeting, September 23-26, 1930, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—W. J. Dickinson, 189 West Madison St., Chicago. Regular meetings, 3rd Monday each month, except June, July and August.

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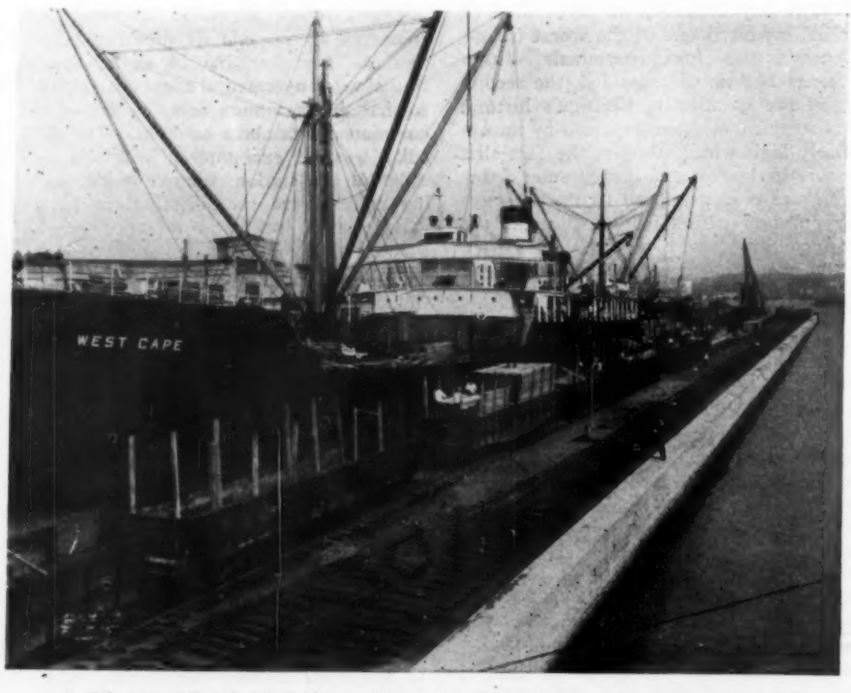


A Munson-McCormick Liner Unloading Lumber at the Lackawanna's New Pier, Hoboken, N. J.

Traffic

The New York, Chicago & St. Louis has added single bedroom sleeping cars to its Chicago-Cleveland service, the cars being available on the 11:20 p.m. train from Chicago and the 12:10 a.m. train from Cleveland.

The Beardslee Launch & Barge Service, Inc., has applied to the Interstate Commerce Commission for a certificate of public convenience and necessity authorizing it to engage in the transportation of lumber and other forest products by barge from Service, Ala., via the Tombigbee and Mobile rivers to Mobile, Ala., and thence via the Mobile & Ohio Railroad and its connections to northern, eastern and western points.

The Chicago, Milwaukee, St. Paul & Pacific has installed radio receiving sets on the Southwest Limited, operated between Chicago and Excelsior Springs and Kansas City, thereby bringing the number of this road's trains out of Chicago thus equipped to four. The observation or club cars on the Pioneer Limited from Chicago to Milwaukee, and the Twin Cities, the Arrow to Des Moines, Omaha and Sioux City and the Olympian to the North Pacific coast, in addition to the Southwest Limited are equipped with speaker sets so constructed that the speakers can be cut in or out in different parts of the cars.

Burlington Exhibits New Trains

The Chicago, Burlington & Quincy, on December 20, exhibited the new cars for its trains, the Blackhawk, which operates between Chicago and the Twin Cities, the Aristocrat, which operates between Chicago and Denver and the Ak-Sar-Ben which operates between Chicago and Lincoln. C. Ward Seabury, president of the Chicago Association of Commerce; F. E. Williamson, president of the railroad; Albert Cotsworth Jr., passenger traffic manager of the road; E. Comanche, the railroad's "relic" of the old west, who tells radio yarns and Lorado Taft, the sculptor, took part in the formal dedication of the new trains. Taft was invited because he was the maker of the huge statute of the Indian, "Blackhawk," at Oregon, Ill., after which one of the trains is christened.

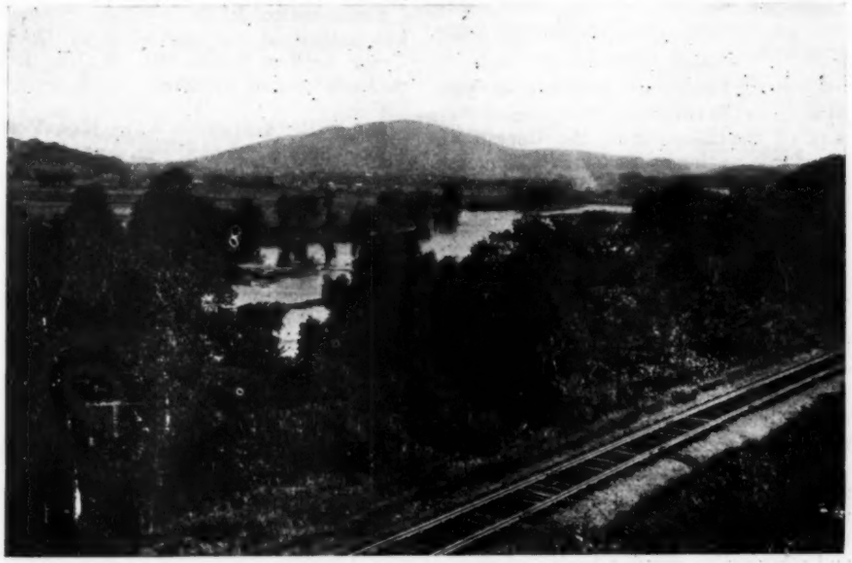
Southwestern Lines Object to Proposed Barge Line Rates

The Southwestern railroads have filed with the Interstate Commerce Commission a reply objecting to the petition filed by the Inland Waterways Corporation in which the commission is asked to prescribe joint through rates from points in C. F. A. and Western Trunk Line territory to points in Texas and Louisiana by the federal barge line on the basis of using as a factor 20 per cent less than the lowest all-rail rate between the ports on the barge line.

The reply states that the roads are unalterably opposed to such rates, which they say would result in wasteful transportation and deprive the rail carriers of traffic "in utter disregard of law, the needs of the nation's commerce and the cost of the service."

"The establishment of the through routes and joint rates herein prayed for by the barge line," they say, "is a request for forcing the rail carriers to subsidize a government agency undertaking to serve the commerce of the nation without regard to the cost of handling the traffic and by means of subsidies resulting in the destruction of efficient rail competition and the unnecessary and wasteful depletion of rail carrier revenue without cause or justification."

* * * *



Along the Boston & Maine, Near Woodsville, N. H.

Equipment and Supplies

Locomotives

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA are inquiring for three 2-8-2 type locomotives.

THE SOUTHERN PACIFIC has ordered 25 mallet type (4-8-8-2) locomotives and 14 of the 4-8-4 type locomotives from the Baldwin Locomotive Works. Inquiry for 40 locomotives was reported in the *Railway Age* of November 16.

Freight Cars

THE ILLINOIS TERMINAL has ordered 50 steel underframes for box cars from the American Car & Foundry Company.

THE SOUTHERN has ordered 22 mail and baggage cars and one postal car from the Bethlehem Steel Company. Inquiry for this equipment was reported in the *Railway Age* of December 14.

Passenger Cars

THE READING has ordered one combination passenger, baggage and mail gas-electric rail motor car from the J. G. Brill Company.

THE INTERNATIONAL RAILWAYS OF CENTRAL AMERICA are inquiring for five first class coaches, seven second class coaches and three baggage cars.

Iron and Steel

THE BALTIMORE & OHIO has ordered 765 tons of structural steel for a bridge at Ohio Junction, Ohio, from the Mt. Vernon Bridge Company.

Signaling

Signaling for the New Philadelphia Terminal

The Pennsylvania has ordered from the Union Switch & Signal Company material for signals and switches which must be changed in connection with the first stage in the development of the new and enlarged passenger facilities connected with the building of a new station at West Philadelphia and the abandonment of the present track layout at Broad street station. This order consists principally of electro-pneumatic interlocking, totaling 336 levers. At the Schuylkill River bridge (Zoo Garden) there will be a machine of 211 levers, and in the new underground terminal at Eighteenth street the machine will have 135 levers. These two plants involve the installation of 270 position-light signals, including both high and dwarf signals; 140 switch movements, and 22 double slip and movable frog layouts.

Supply Trade

The Wagner Electric Corporation has moved its Chicago sales office and service station to 1935 Indiana avenue.

H. H. Hale, with headquarters at 75 Freemont Street, San Francisco, Cal., now represents the **Gold Car Heating & Lighting Company,** Brooklyn, N. Y.

The Vapor Car Heating Company, Inc., on January 1, will move its Washington, D. C., office from the Munsey building to the Investment building, Fifteenth and K. streets, N. W.

The National Aluminate Corporation, Chicago, has opened an office at suite 1006, 11 West Forty-Second street, New York, **H. A. Marshall,** eastern railway representative, being in charge.

H. M. Davison, eastern territory manager of excavator sales for the **Harnischfeger Sales Corporation,** has been promoted to general sales manager with headquarters at Milwaukee, Wis.

Higgins & Company have been appointed railway sales representatives of the **Gardner-Denver Company** for the Chicago district, and will hereafter handle the full line of railway equipment manufactured by the latter company.

The American Steel Foundries has disposed of its Thurlow plant at Chester, Pa., to the **General Steel Castings Corporation** in exchange for stock in that company. This plant will, in the future, be operated by the General Steel Castings Corporation, which will probably continue to manufacture approximately the same class of products that has been previously produced at this plant.

Obituary

Irving T. Hartz, president of the Morden Frog & Crossing Company, Chicago, died on December 17 following an operation.

John M. Hansen, chairman of the board of directors of the Standard Steel Car Company, who died on December 13, at La Rochelle, France, was born in 1873 in Butler county, Pa. Because of a typographical error the year of Mr. Hansen's birth was reported as 1863 in the *Railway Age* of December 21, page 1439.

William Paton Thomson, who resigned as vice-president of the Rail Joint Company on September 30, on account of poor health, and a well-known civil engineer of New York, died in the Atlantic City Hospital on December 21 after an illness of several months. Mr. Thomson was born on October 7, 1872, at Scotland, Pa. He graduated from Princeton University in 1896 and had devoted much of his time to the problem of railroad track construction. In 1880 he entered the service of the Pennsylvania Railroad and in 1914 went to the Rail Joint Company as vice-president in charge of engineering and design. Mr. Thomson was the patentee of many railway devices.

Fred D. Holdsworth, engineer in charge of air compressor design for the Sullivan Machinery Company at its Claremont, N. H. plant from 1900 to 1928, died on November 20. Mr. Holdsworth was born at Wales, Mass., on October 23, 1867. He was graduated from Worcester Polytechnic Institute in 1888, and after serving as mechanical engineer with the Rhode Island Locomotive Works and with the G. F. Blake Company, afterwards Blake & Knowles, he joined the Sullivan staff in 1900, remaining at Claremont as mechanical engineer in charge of air compressor design until his retirement, about a year ago. Mr. Holdsworth was awarded nearly 50 patents connected with the development of various Sullivan machines.

Trade Publications

ROTARY RAILROAD CAR DUMPER.—An eight-page book, No. 1004, describing the Link-Belt rotary railroad car dumper has been issued by the Link-Belt Company, 910 South Michigan avenue, Chicago. The book illustrates the dumper in various positions, and a double-page spread points out the main features of its mechanism.

MANUAL OF LIGHTING PRACTICE FOR RAILROADS.—A bulletin which is a complete reprint of Section E of the Manual of Recommended Practice of the Association of Railway Electrical Engineers, is published under permission of the Association by the Westinghouse Lamp Company, 150 Broadway, New York, N. Y. The bulletin bears the number E-106 and deals with fundamentals of illumination, railway shop and roundhouse lighting, office and drafting room lighting, passenger and freight station lighting, store, warehouse and pier lighting, yard lighting, car lighting, and incandescent lamp standards.

ANNUAL REPORT OF DIRECTOR OF THE BUREAU OF STANDARDS.—The Annual Report of the Director of the Bureau of Standards to the Secretary of Commerce for the fiscal year ended June 30, 1929, is contained in Miscellaneous Publication No. 102, which can be obtained at a price of ten cents from the Superintendent of Documents, Washington, D. C. The report covers the general activities of the Bureau and outlines the various outstanding accomplishments, grouped according to subjects, for which specific appropriations had been made by Congress. Among the subjects covered in these appropriations were the testing of structural materials, testing machines, standardizing mechanical applications, gage standardization, metallurgical research, high-temperature investigation, testing railroad-track and other scales, standardization of equipment, investigation of automotive engines, etc.

Construction

ASHLEY, DREW & NORTHERN.—This road plans during 1930 to reballast its roadbed between Monticello, Ark., and Crossett, a distance of 41 miles, to lay several miles of heavier rail than any now in use on the road, and to construct improvements in its terminal facilities.

BOSTON & ALBANY.—Contracts have been awarded by this company for the construction of a new power house at Beacon Park, Allston, Mass., in connection with a general program of terminal development at that point. The new building, which will measure 88 ft. by 62 feet with a height of 52 ft., will be of brick construction and is to be equipped with two Sterling 445-hp. water tube boilers operating at 180 lb. pressure, using pulverized coal as fuel and fitted with automatic soot blowers. The fuel will be prepared by two 4,000-lb. capacity pulverizers to be installed on the firing floor of the power house. The improvement program which the Boston & Albany is carrying out at Allston at a total cost of $1,015,000, and of which the new power station is a part, also includes a 25-stall engine house, with drop pits, and a new 100-ft. turn table. A concrete coaling station of 1,000 tons' capacity, a new 750-ton sanding plant, four water-type ash pits and necessary track changes which formed essential parts of the project have already been completed at a cost of approximately $375,000.

BUFFALO, ROCHESTER & PITTSBURGH.—Elimination of the Stottsville-Mumford state highway crossing at Mumford, N. Y., has been directed by the Public Service Commission of New York. The plan of elimination contemplates carrying the highway over the railroad at a probable cost of $119,000, exclusive of land and damages.

CHESAPEAKE & OHIO.—This company has authorized the rebuilding of Upton Creek Arch at Spring Hill, W. Va., at a probable cost of $31,000.

DELAWARE & HUDSON.—The New York Public Service Commission has directed the elimination of grade crossings on this company's lines at East Main street, Cobleskill, N. Y., by elevating the grade of the railroad, at an estimated cost of $153,000, and at Main street, Unadilla, N. Y., by carrying the street over the tracks according to a plan submitted by the railroad, at a probable cost of $124,000.

DELAWARE, LACKAWANNA & WESTERN.—The New York Public Service Commission has approved an estimate of cost totaling $113,300, exclusive of land and damages, for the elimination of the La-Fayette-Tully state highway crossing of this company's tracks south of Tully, N. Y.

ERIE.—The Public Service Commission of New York has directed the elimina-

tion of the Kelly crossing of the Erie west of Erwin station, N. Y., by elevating the grade of the highway and carrying it over the tracks west of the present crossing. The approximate cost of the work is estimated at $163,000.

ERIE.—Crossings of this company's lines at Wildwood avenue, Salamanca, N. Y., and at Patterson on the Corning-Painted Post state highway, two miles west of Painted Post, N. Y., have been ordered for elimination by the New York Public Service Commission. The former crossing is to be eliminated by carrying the highway under the railroad at a cost of approximately $113,000, while the railroad plan for the elimination of the latter involves raising the grade of the highway to carry it over the tracks at an estimated cost of $142,100.

GULF COAST LINES (St. Louis, Brownsville & Mexico).—Bids have been received for the construction of a one-story brick, reinforced concrete and stucco passenger station, which will have outside dimensions of 66 ft. by 22 ft., at Weslaco, Tex.

GULF, COLORADO & SANTA FE.—This company is taking bids for the construction of several storehouse and warehouse units at Cleburne, Tex. These include a two-story brick storehouse with dimensions of 60 ft. by 662 ft., a one-story brick warehouse, 24 ft. wide by 192 ft. long, with a platform with dimensions of 86 ft. by 530 ft., and a one-story reinforced concrete warehouse which will have dimensions of 24 ft. by 580 ft.

MAINE CENTRAL.—This company is receiving bids for the construction of a new 110-ft. turntable at Waterville, Me., the cost of which is estimated at $55,000, and for steel for strengthening Frankenstein trestle at Crawford Notch, N. H., at a probable cost of $75,000.

LOUISVILLE & NASHVILLE.—This company plans the elimination of three highway grade crossings at Covington, Ky., by the construction of two underpasses and one viaduct, at a cost of about $365,000.

NEW YORK CENTRAL.—The Public Service Commission of New York has directed the elimination of the following grade crossings on this company's lines: Lyell and Glide streets, Rochester, N. Y., by depressing the grades of the two streets and carrying the railroad tracks over them on three span plate girder bridges, at a total estimated cost of $674,000, including land and damages; Railroad street, Adams, N. Y., by depressing the grade of the street and carrying it under the railroad tracks, at an approximate cost of $135,800, and State street, Harrisville, N. Y., by raising the grade of the street and carrying it over the tracks west of the present crossing, at a probable cost of $65,000. The Commission has also approved an estimate of cost totaling $113,800 for the reconstruction of the bridge carrying the Whitesboro-Trenton state highway over the New York Central tracks in Marcy, N. Y., and has notified the New York Central that it does not consider as excessive the low bid of $64,461, submitted by the Walsh Construction Company of Syracuse, N. Y., for the elimination of the Main street crossing in Cold Springs, N. Y.

PENNSYLVANIA.—A contract for the construction of a one and two-story reinforced concrete brick and steel freight station on a concrete pile foundation at Dayton, Ohio, has been awarded to the H. R. Blagg Company, Dayton. The station will have outside dimensions of 50 ft. by 500 ft. and will involve an expenditure of about $225,000.

PENNSYLVANIA.—This company has been notified by the Public Service Commission of New York that it does not consider as excessive the low bid of $66,363 submitted by the Arthur McMullen Company of New York City for the elimination of the Phelps-Clifton Springs highway grade crossing in Phelps, N. Y. The Commission has further notified the railroad that it does not consider excessive the bid of the American Steel Engineering Company, Cannonsburg, Pa., 2.51 cents per lb., for furnishing and delivering the reinforcing steel necessary for the elimination, and has directed the railroad to award the necessary contracts and to begin work as soon as practicable.

PITTSBURGH & WEST VIRGINIA.—This company has let to the Vang Construction Company, of Baltimore, Md., a contract for the construction of the third section of its Connellsville extension. The section covered by this contract extends from the bridge across the Monongahela river at Belle Vernon, Pa., to a point two miles south of Scottdale, Pa., and is to be built at an estimated cost of $4,500,000. Work will be started at once, and will be completed early next July. The present contract is in addition to those for the construction for the first and second sections of the extension, extending a total of 18 miles from Cochran Mills to Belle Vernon, which were also awarded to the Vang Construction Company.

TEXAS ROADS.—Examiner Thomas F. Sullivan of the Interstate Commerce Commission has submitted a proposed report covering a series of applications proposing a considerable amount of new construction in Texas including applications filed by subsidiaries of the Frisco and Rock Island systems having for their object the furnishing of a through and shorter route than is now available to those carriers from northern Texas and southwestern Oklahoma to Fort Worth and Dallas. The Frisco also proposes to acquire control of the Gulf, Texas & Western, a short line operating between Salesville Junction and Seymour, Tex., 99.6 miles. The report recommends that the commission authorize the construction by the St. Louis, San Francisco & Texas of a line from Vernon to Seymour, Tex., 42 miles, and operation under trackage rights over the line of the Chicago, Rock Island & Gulf between Jacksboro and Fort Worth, Tex., 71.6 miles. He also recommends that the commission authorize the acquisition of control by lease of the Gulf, Texas & Western and find that the purchase of stock of the company would be in the public interest but that the consideration proposed to be paid for the stock has not been shown to be just and reasonable. Authorization is also recommended of operation by the St. Louis, San Francisco & Texas under trackage rights over a proposed line of the Chicago, Rock Island & Gulf between Quanah and a point on the proposed Vernon-Seymour line, 35 miles. It is also recommended that the commission authorize the C., R. I. & G. to build a line from Shamrock to a connection with the St. L., S. F. & T. approximately 5 miles north of Quanah and from Quanah southeasterly to a connection with the proposed Vernon-Seymour line at Beaver Creek, 108 miles, and operate under trackage rights over the St. L., S. F. & T. between Quanah and the point of connection of the proposed line 5 miles north thereof, as well as over the proposed Vernon-Seymour line between Beaver Creek and Seymour, 29 miles, and over the line of the Gulf, Texas & Western between Seymour and Jacksboro, 76 miles. The examiner also recommends that the commission authorize the construction by the Clinton-Oklahoma Western of Texas of a line from Heaton to a point north of the north fork of the Red river, 8.7 miles, but that it deny an application of the Forth Worth & Denver Northern for authority for a line from Childress to Pampa, Tex., 110 miles.

TEXAS & PACIFIC.—This company plans the replacement of its bridge over Mountain creek between Dallas, Tex., and Fort Worth, which was recently destroyed by fire, with a new structure, at a cost of about $40,000. It is also planned to construct a new double-track bridge over the Trinity river near Dallas, which will be about 2,000 feet long and will have a steel truss span over the channel 200 ft. long.

VIRGINIAN.—Examiner Ralph R. Molster of the Interstate Commerce Commission has recommended, in a proposed report that the commission grant this company's application for a certificate authorizing the construction of a proposed extension of its line from Deepwater by a bridge across the Kanawha river to a connection with the Kanawha & Michigan on the north side of the river, approximately one mile, in Fayette county, W. Va.

First Contract Awarded For West Side Improvement

The initial construction contract under the agreement between the New York Central and the City of New York, as approved by the Transit Commission of New York and the Interstate Commerce Commission, was awarded on December 16 to the Arthur McMullen Company of New York City.

This contract provides for the rearrangement of the existing railroad facilities at the south end of the Sixtieth street yard in order to clear the way for subway construction to permit the main tracks to be depressed at the entrance to the yard. The work also involves changing the facilities for handling automobiles

and the construction of a new milk yard which will concentrate the handling of milk at Sixtieth street and will allow the removal of the tracks now used for that purpose from the block between Twenty-Ninth and Thirtieth streets and Ninth and Tenth avenues, the site of the proposed new building of the U. S. Post Office department.

Actual work under the contract with the McMullen Company will start immediately. Other contracts will follow as rapidly as details can be developed and necessary arrangements made.

A considerable amount of work in connection with the west side improvement has been in progress for some time, including construction of new shops and engine terminal facilities at Harmon, N. Y., for the accommodation of the new electric motive power to be used on the west side. Contracts for these improvements have been reported from time to time in the *Railway Age*. Orders have also been placed for new oil-electric and electric locomotives, as reported in the *Railway Age* of September 7 and 28, and duct line work which has been in progress for some time is approaching completion. The work of reconstructing tracks in order to provide for electrification north of Seventy-Second street will be started in the near future.

Centralized Control on B. & M.

The Boston & Maine announces that dispatcher control apparatus, for the direction of all trains, is now in use on its line from Eagle Bridge, N. Y., to Hoosick Falls, 4½ miles, and that the total expenditure of the company for this system of operation within the next year will amount to $2,000,000. The system was put in operation between Ayer, Mass., and North Chelmsford, some time ago. It is being installed from East Fitchburg to Eagle Bridge and has been authorized for the lines from Portland, Me., to North Berwick, and to Dover, N. H. The plans include also the installation of dispatcher control between North Chelmsford and Lowell Junction.

* * *

A Southern Pacific Train at Burbank, Cal.

Railway Finance

BALTIMORE & OHIO.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Buffalo & Susquehanna by purchase of a majority of its capital stock at $90 a share. The application states that it is proposed to use the line in the establishment of the proposed new short low-grade line between Chicago and Philadelphia and New York which would make unnecessary the expenditure of from $30,000,000 to $40,000,000 in the revision of the present line west of Pittsburgh. For such a line it would be necessary to use 74 miles of the Buffalo, Rochester & Pittsburgh from Butler to B. & S. Junction, and about 50 miles of the B. & S. from B. & S. Junction to Driftwood, Pa., from which point the line would proceed either by new construction or by use of existing facilities to Williamsport, Pa., and thence over the lines of the Reading and Central of New Jersey

BLACK HILLS & NORTHEASTERN.—*Incorporation.*—Articles of incorporation for this company were filed with the secretary of state of South Dakota on December 18 for the purpose of constructing a railroad from Isabel, S. D., in Dewey county, to Belle Fourche, in Butte County 135 miles. The proposed line would also cross Ziebach, Corson, Perkins and Meade counties, serving a section of South Dakota which is at present without railway facilities. It would connect with the Chicago, Milwaukee, St. Paul & Pacific at Isabel and with the Chicago & North Western at Belle Fourche. The directors of the new company are D. R. Perkins, F. A. Brown and R. A. H. Brandt of Bison, S. D.; P. W. Daugherty of Webster, S. D.; W. M. Janig, Lester M. Davis and W. S. Given of Britton, S. D.; George F. Anderson of Mound City, S. D.; and H. M. Knight of Sisseton, S. D. The capitalization of the proposed railroad is $1,000,000 and it is planned to finance the company through the aid of farmers in the section to be served.

CHESAPEAKE & OHIO.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell $35,088,000 of refunding and improvement mortgage 4½ per cent bonds, the proceeds to be used to retire $31,390,000 of 20-year bonds due February 1, and to reimburse the treasury for expenditures in retiring $3,698,000 of general refunding and improvement bonds. It is expected to sell the bonds at not less than 92.5.

CLACKAMAS EASTERN.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate a logging road owned by the Security Savings & Trust Company, extending 13 miles in a general southeasterly direction from Clackamas station, Ore., and to build an extension of 4 miles.

CHICAGO, ROCK ISLAND & PACIFIC.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $900,000 of general mortgage 4 per cent bonds, to reimburse its treasury and to be deposited with a trustee as the basis for an issue of $900,000 of first and refunding mortgage bonds.

DULUTH, MISSABE & NORTHERN.—*Acquisition of D. & I. R.*—The Interstate Commerce Commission has approved the acquisition of control of the Duluth & Iron Range by lease for 15 years, with provision for extension from year to year, not to exceed 99 years in all, at a fixed rental of $1,200,000 a year plus an amount representing depreciation. The Missabe operates 305.7 miles of main line in Minnesota, while the iron range operates 269.7 miles. The report states that the Missabe has paid to the government as excess earnings, a total of $4,128,450 for the years 1920 to 1928, calculated on a claimed valuation of $120,490.842, and that the rate of return earned on the tentative valuation in 1927 was 13.02 per cent. The Iron Range used a value for recapture purposes of $77,382,773, as compared with an investment in road and equipment of $30,038,470, and no excess earnings have ever been paid to the government. The rate of return on the tentative valuation in recent years is said to have been about 6 per cent. Annual savings amounting to at least $500,000 a year are expected by the applicant to result from the unification.

GULF, MOBILE & NORTHERN.—*Acquisition.*—The Interstate Commerce Commission has authorized this company to control the New Orleans Great Northern by purchase of capital stock and to issue $2,727,273 of common stock to be delivered in exchange for the stock of the N. O. G. N.

MIDLAND VALLEY.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell or pledge $289,000 of first mortgage 5 per cent bonds to reimburse the treasury for expenditures.

MISSISSIPPI SOUTHERN.—*Abandonment.*—The Interstate Commerce Commission has authorized the Edward Hines Yellow Pine trustees to abandon the operation of the Mississippi Southern Railroad.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a spur line from Tracy City, Tenn., to Pryor Ridge, 5 miles; its "Q" line spur extending one mile from M. P. 24.74 on the Tracy City branch; and its flat branch spur, extending 2 miles from M. P. 25.25 on the Tracy City branch.

NORTHWESTERN PACIFIC.—*Abandonment.*—Examiner C. P. Howard of the Inter-

state Commerce Commission has submitted a proposed report recommending that the certificate issued February 11 authorizing this company to abandon its line from Point Reyes to Monte Rio, Calif., 36.48 miles, be confirmed.

PENNSYLVANIA.—*Stock.*—The Interstate Commerce Commission has authorized this company to issue $71,836,050 of capital stock of a par value of $50.00 per share to be offered to present stockholders at par.

ST. LOUIS & O'FALLON.—*Valuation Argument.*—The Interstate Commerce Commission announced on December 19 that the further argument which it had assigned the day before January 23 in the proceeding involving the ascertainment of the value for recapture purposes "will be on the question of how the commission shall proceed to comply with the mandate of the Supreme Court."

ST. LOUIS, SAN FRANCISCO & TEXAS.—*Acquisition.*—Examiner Thomas F. Sullivan of the Interstate Commerce Commission has submitted a proposed report recommending that the commission authorize the acquisition of control by this company of the Gulf, Texas & Western, which has a line from Salesville Junction to Jacksboro and Seymour, Tex., 99.6 miles, by lease, and that the acquisition of control by stock ownership would be in public interest, but that the consideration proposed to be paid for the stock, $2,300,000, has not been shown to be just and reasonable. The commission had fixed the final value for the property as of 1917 at $1,668,000 and the examiner says that in the light of the facts of record the commission would not be justified in approving a consideration in excess of $1,800,000.

Valuation Reports

The Interstate Commerce Commission has issued final valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes as of the respective valuation dates as follows:

Western of Alabama.....	$6,125,000	1918
Denver & Rio Grande....	101,500,000	1919
Atlanta & West Point....	6,225,000	1918

Average Prices of Stocks and of Bonds

	Dec. 24	Last week	Last year
Average price of 20 representative railway stocks..	126.72	131.27	127.70
Average price of 20 representative railway bonds..	92.44	93.05	92.93

Dividends Declared

Baltimore & Ohio.—Common, 1¼ per cent, quarterly; Preferred, 1 per cent, quarterly, both payable March 1 to holders of record January 18.

Central Railroad of New Jersey.—Extra, 2 per cent, payable January 15 to holders of record December 31.

Delaware Railroad.—2 per cent, payable January 1 to holders of record December 14.

Kansas City Southern.—Common, 1¼ per cent, payable February 1 to holders of record December 31; Preferred 1 per cent, quarterly, payable January 15 to holders of record December 31.

Louisville & Nashville.—3½ per cent, payable February 10 to holders of record January 15.

Reading Company.—Common, $1.00, quarterly, payable February 13 to holders of record January 16.

Railway Officers

Executive

H. R. German, assistant secretary of the Lehigh Valley, with headquarters in New York, has been appointed assistant to the president, with the same headquarters.

J. W. Smith, general manager of the Boston & Maine, with headquarters in Boston, Mass., has been appointed vice-president and general manager of the road, with the same headquarters.

James D. Watson, who has been promoted to assistant to the president of the St. Louis Southwestern lines and will act as personal representative of the president of that road in Missouri, Arkansas and Louisiana, with headquarters at St. Louis, Mo., has been connected with railways for more than 49 years. He was born at Port Huron, Mich., on June 30, 1870, and attended the public schools of Little Rock, Ark. Mr. Watson entered railroad service at the age of 10 years as a messenger on the St. Louis, Iron Mountain & Southern (now part of the Missouri Pacific). For the following 15 years he was engaged in various positions in the machinery, car, store, operating and traffic departments of that company and on October 15, 1895, he became a contract-

J. D. Watson

ing agent for the Cotton Belt. Later he served successively on the Cotton Belt as traveling freight agent, division freight agent, chief clerk in the general freight office at St. Louis and assistant general freight agent at the same point. From November 1, 1913, to May 1, 1914, Mr. Watson was vice-chairman of the Southwestern Tariff Committee, then returning to the Cotton Belt as assistant freight traffic manager. From June 1, 1917, to January 15, 1920, he acted successively as assistant to the president of that road and as assistant, division of traffic, United States Railroad Administration. On the latter date he was appointed general traffic manager of the St. Louis Southwestern, with headquarters at St. Louis, a position he held until his promotion to assistant to the president on December 12.

John R. Turney, who has been elected vice-president in charge of traffic and law of the St. Louis Southwestern lines, with headquarters at St. Louis, Mo., and Tyler, Tex., has been connected with the legal department of the Cotton Belt for nearly 13 years. He was born at Nashville, Tenn., in 1887 and received his law degree from Vanderbilt University in 1908. After engaging in private practice for a number of years he became associated with the Cotton Belt in January, 1917. With that company he has served successively as assistant

J. R. Turney

attorney, general attorney, assistant general solicitor and general solicitor, at the same time being a member of the law firm of Carter, Jones & Turney. Mr. Turney has become familiar with traffic matters through his presentation before the Interstate Commerce Commission of the Memphis-Southwestern and Natchez-Louisiana rate cases and other cases involving southwestern carriers. He also assisted in designing the plan for the creation of a Cotton Belt direct water-level route between St. Louis and Memphis through the acquisition of short lines in the St. Francis Basin and presented it to the Commission. Mr. Turney's election as vice-president became effective on December 12.

Financial, Legal and Accounting

A. D. Daniel, passenger traffic manager of the Atlanta, Birmingham & Coast, with headquarters at Atlanta, Ga., has been appointed auditor of that company, with headquarters at the same point, succeeding **E. L. Greene,** de-

ceased. The office of passenger traffic manager has been abolished. **T. R. Bryan** has been appointed general passenger agent, with headquarters at Atlanta.

Operating

R. C. Morse, general superintendent of the New York Zone of the Pennsylvania, has been appointed assistant general manager of the New York Zone, with headquarters in New York City, effective January 1.

Caleb Corser, trainmaster of the Dakota division of the Northern Pacific at Jamestown, N. D., has been transferred to the St. Paul division at Minneapolis, Minn. **Thomas J. Kane,** trainmaster of the Fargo division at Staples, Minn., has been transferred to the Dakota division to succeed Mr. Corser.

L. L. Lowe, who has been appointed superintendent of the New Orleans & Lower Coast, with headquarters at Algiers, La., has been connected with the Missouri Pacific for seven years. He was born at Independence, Mo., on November 17, 1895, and was first engaged in engineering work as a rodman on levee construction at Cairo, Ill., in 1913. Later he was an instrument man in the office of the city engineer at Cairo, and from 1914 to 1922 he served as an instrument man and inspector on levee construction with the Mississippi River Commission. On October 11 of the latter year Mr. Lowe entered railway service as a rodman on the Missouri division of the Missouri Pacific. Later he occupied the positions of instrument man on the Northern Kansas, the Louisiana and the Eastern divisions and in 1927 he was advanced to assistant roadmaster on the Eastern division, where he remained until July of the same year when he was promoted to roadmaster of the Louisiana division. On January 15, 1929, Mr. Lowe was transferred to the White River division, a position he held until his appointment as superintendent of the New Orleans & Lower Coast on November 5.

Traffic

J. B. Finucane has been appointed division freight and passenger agent of the New York Central, with headquarters at Watertown, N. Y, succeeding **F. L. Wilson,** who has retired.

William A. Shackelford, district passenger representative of the Canadian Pacific at Boston, Mass., has been promoted to general agent of the passenger department at Pittsburgh, Pa., effective January 1, succeeding **Clarence L. Williams,** who retires from active duty on that date after 43 years of service with the Canadian Pacific.

George W. Wood, general western freight agent of the Chesapeake & Ohio, with headquarters at Cincinnati, Ohio, has been promoted to assistant general freight agent, with headquarters at Chicago, succeeding **H. P. Hathaway,** deceased. **A. M. Glassmeyer,** general traveling agent at Cincinnati, has been promoted to general western freight agent to succeed Mr. Wood.

J. C. Cumming, general baggage agent on the Union Pacific system at Portland, Ore., has been appointed assistant general passenger agent, with headquarters at the same point, succeeding **A. C. Martin,** who will retire from active service on January 1. **E. A. Klippel, Jr.,** general agent of the passenger department at Portland, has been promoted to assistant general passenger agent at that point. **Burton Beck** has been appointed general agent of the passenger department at Portland, succeeding Mr. Klippel.

William F. Murray, who has been appointed traffic manager of the St. Louis Southwestern lines, with headquarters at St. Louis, Mo., and Tyler,

William F. Murray

Tex., in charge of relations with public, civic and commercial organizations, has been connected with that railway for 27 years. He was born on October 7, 1881, at Bloomington, Ill., and entered railway service in June, 1901, as a record clerk on the Cotton Belt in Texas. Later he was advanced through the positions of stenographer, rate clerk, chief rate clerk and chief clerk and in June, 1910, he became chief clerk in the traffic department of the Missouri, Kansas & Texas of Texas at Dallas, Tex. Mr. Murray returned to the Cotton Belt in the following year as general agent of the freight department in Texas. In February, 1912, he was promoted to assistant general freight agent, with headquarters at Tyler, then being further promoted to general freight agent at the same point on March 1, 1920. In December, 1927, Mr. Murray was promoted to freight traffic manager of the lines in Texas, with headquarters at Tyler, a position he held until his appointment as traffic manager of the system on December 12.

Obituary

N. S. Hunt, assistant to the purchasing agent of the Delaware & Hudson, with headquarters at Albany, died at his home in that city on December 19.

L. M. Bates, division engineer of the Chicago & North Western, with headquarters at South Pekin, Ill., was found dead at his home in that city on December 21.

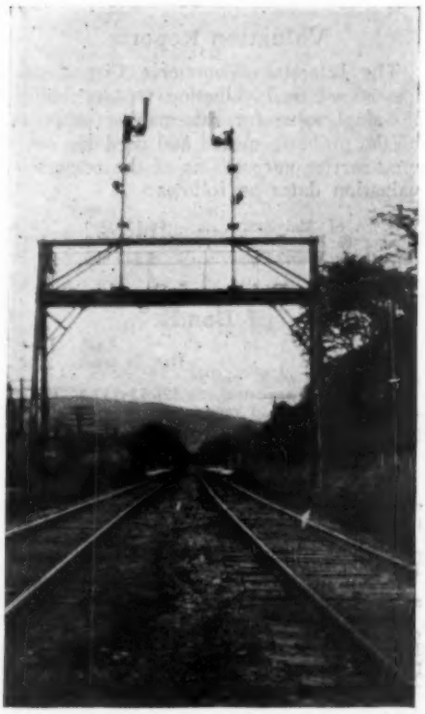
Russell J. Allyn, assistant general freight agent of the New York Central, with headquarters at Detroit, Mich., was found dead at a hotel at Cleveland, Ohio, on December 17.

George D. Dager, superintendent of the Rochester division of the New York Central, died suddenly at his home in Rochester on December 19, at the age of 60 years.

R. B. Luckey, assistant treasurer of the Baltimore & Ohio, with headquarters at New York, died of pneumonia at the Mountainside Hospital, Montclair, N. J., on December 21, at the age of 65.

P. F. Brendlinger, former chief engineer of the Schuylkill Valley division of the Pennsylvania, died on December 16 at the Joseph Price Memorial Hospital in Philadelphia, at the age of 79 years. Mr. Brendlinger was also at one time connected with the engineering department of the Pittsburgh, McKeesport & Youghiogheny, later resigning from railroad work to engage in business for himself.

* * *



On the Chicago & North Western Near Devil's Lake, Wis.

Railway Age
Motor Transport Section
Devoted to the Co-ordination of Railway and Highway Service

Vol. 87 December 28, 1929 No. 26

The Rights of the Railways

TO railways proposing the operation of motor coaches and trucks no issue is of greater importance at this time than the question of whether they have the right to respond to public demand for highway transportation service, or must stand aside and let others, more quick to recognize the public demand, meet this demand alone. The question is not new, but it is still a live one, and there is reason to believe that it will become even more pressing if and when Congress takes the necessary steps to place interstate motor coach operations under a system of regulation. For several years, various railways have been fighting for what they consider their rights on the highways, but they have had comparatively little success.

The situation can scarcely be other than well-known to railway officers. The railways have contributed largely to the welfare and development of the territories which they serve. For years they alone met quite adequately the transportation needs of their patrons. Then, with the development of hard roads and the production of motor vehicles suitably designed for the transportation of passengers in considerable numbers and of freight in fairly substantial quantities, they were faced with severe competition. Quite soon the states began to regulate common carrier transportation on their highways with a view to limiting the competition thereon, and the railways' competitors, being first in the field, were granted permission to operate motor vehicles, such permits carrying with them a literal monopoly of the highways in so far as common carrier transportation is concerned.

Now the railways, feeling the effects of highway competition and recognizing the place in transportation which the motor vehicle occupies, desire on their own part to provide motor transportation service co-ordinated with their railway service, to the end that the interests of their patrons and themselves will be better served. But immediately they encounter a difficulty in the operating certificates held by their highway competitors and in the semi-monopolistic character of the certificates. The railways, in such circumstances, are forced to refrain from operation on the highways or to purchase the operating rights of their highway competitors, usually at prices which are not by any means modest.

The basic question is whether the railways, having pioneered in and developed their territories, have the right, as well as the duty, to adjust themselves to modern conditions, and to provide their patrons with the transportation service, of whatever kind, which they may demand. The Pennsylvania and the Reading have raised this issue in their appeal to the New Jersey Supreme Court from the decision of the Board of Public Utility Commissioners of New Jersey granting to certain newcomers in the territory rights which they denied to the railways, to provide certain kinds of motor coach service between Camden, N. J., and Atlantic City—a locality which the railways have served faithfully and well for many years. An abstract of the brief filed by the Pennsylvania with the supreme court is published on other pages of this issue, and railways faced with the same problem as the Pennsylvania and Reading may find in it material of interest and value.

Obviously, in the ordinary case of an independent operator already on the highway and a railroad attempting to operate over it, there is much to be said on the side of the independent operator, as well as on that of the railway. As pioneers in motor transportation who have rendered the public a definite service, such motor vehicle operators have rights which merit protection. At the same time, it would appear that the railways have an even greater right to protection in territories which they were serving and developing long before motor vehicles existed. By "protection of the railways" is not necessarily meant the stifling of other forms of transportation; the demand for highway transportation on the part of the public actually exists, and it deserves to be met with this form of service. On the other hand, when railways desire to protect their own interests and the interests of their patrons, whom they have served for many years, by the establishment of their own highway transportation service, they should certainly have a right to do so.

The position of the railways, in connection with this issue, may be stated by brief quotations from the contentions of the Pennsylvania in the Atlantic City case: "The basic question in this case is whether the prose-

cutors have in this territory, which they have been serving for 75 years, a right to protection from destructive competition, or whether they may be deprived of the right to protect themselves from destruction, by supplying other transportation facilities to meet the public demand and so save the resulting revenue for the benefit of the existing system. . . . . The rule of law is that an existing railroad has the right to supply all of the service in the territory in which it is operating, to the exclusion of all who seek to enter the territory, so long as it is ready, able and willing to supply the service required by the public necessity and convenience. . . . . Morally, the railroads are entitled to protection because they have served this territory for generations before any other service was available and are still indispensable to this section of the state. . . . . It is unjust to deny them protection from competitors who will usurp the cream of their business and who are unable to supply all the service which the territory requires.

"Especially grave is this injustice in view of the offer of the railroads to supply all of the transportation of whatever character which may be required by the public convenience and necessity in the territory served by them. . . . . Under the decisions of the public utility commissioners and of the courts, they may not enter new territory in competition with a carrier already there. Therefore, they must have preserved to them, free from competition, the territory which they are now serving in order that a great state may not be deprived of a great industry before its usefulness has passed and in order that thousands of investors may feel secure that when they dedicate their property to the public interest, the public will in turn safeguard their investment."

The justice of these contentions will hardly be questioned by the unbiased. Nevertheless, these and similar contentions of the railways have been unavailing in certain instances in the past. Certain it is that until the rights of the railways in connection with motor coach and motor truck operation are firmly established, they will continue to have to pay high and often unjust prices in order to carry out their desire to adjust themselves to modern transportation conditions..

Diesel Engine Progress

THE first motor coach to be equipped with a Diesel engine has recently been placed in operation by the Public Service Co-ordinated Transport of Newark, New Jersey. This is an indication of one direction in which the motor coach of the future may be developed. Diesel engines are used successfully in rail motor cars, switching locomotives, and in Germany, in motor trucks.

In comparison with the gasoline engine, the Diesel offers greater thermal efficiency, use of fuels costing approximately half as much as gasoline, more perfect combustion with less carbon formation, and a better speed-torque characteristic. The Diesel engine in motor truck use has been found to be particularly effective on hills, since its speed-torque characteristic is much better at low speeds that that of the gasoline engine, resulting in less gear shifting and smoother operation. It will also run at a lower speed without stalling.

Manufacturers of small, high-speed Diesel engines in this country are doing extensive development work, and it seems probable that engines of this type, possessing the necessary reliability combined with low weight, will find an increasing application in the field of the motor coach.

Bonus Payments and Employee Efficiency

DOES the payment of bonuses in addition to regular wage scales cause employees to do their work with greater efficiency and to show unusual desire to perform their duties in such manner as to reflect credit upon their employers? The payment of bonuses is not uncommon in motor coach and motor truck operation. Some motor coach companies pay bonuses to drivers who obey operating rules strictly, and are involved over certain periods of time in no accidents for which they are accountable. Certain motor truck operating companies, of which the Columbia Terminals Company of St. Louis is an outstanding example, pay bonuses to their operating department employees on the basis of the volume of freight which they move.

In general, bonuses are paid to employees in return for extra service, service going beyond that which is required of them in return for their regular pay and that which they must render if they wish to keep their jobs. In other cases, bonuses are payments over and above a certain minimum wage scale, which remunerates more efficient employees extra in proportion to their greater efficiency.

Some managements have refrained from establishing bonus systems to reward extra good work because of the conviction that the regular pay which an employee receives is in itself offered in return for the best service of which the employee is capable; and that employees should give the best that is in them in return for their regular pay, without the extra stimulus of the possibility of a bonus payment. The soundness of this theory cannot be questioned, but it does not terminate the issue, because it is in the nature of many employees, unfortunately, to do in return for their pay only so much as is rigidly required of them; and furthermore, from a managerial standpoint, it is difficult to determine whether or not an employee doing his job well enough is actually doing it as well as he might if he put forth his best efforts.

It is difficult to compare the efficiency of the employees of a company which does not pay bonuses with the efficiency of similar employees of companies who do

pay bonuses, so no conclusion can be reached to the effect that bonuses do call forth better efforts from employees. On the other hand, a study of the results obtained by companies which do pay bonuses usually leads to the conclusion that in no other way could they secure such wholehearted co-operation from their employees in carrying on their business with economy and dependability. The fact that so many companies which have adopted the bonus system think highly of its effects, recommends it to other companies which are concerned with the problem of obtaining more and better work from their employees.

Extending the Useful Life of Motor Coach Equipment

WHAT should be done with motor coaches which have been made obsolete by the recent improvements in the design of motor equipment? Three years ago the standard coach had a four-cylinder motor and service brakes operating only on the rear wheels. Today the modern coach has a six-cylinder or eight-cylinder motor of double the former power capacity, and has brakes operating on all four wheels. The older bodies used for inter-city work did not have sufficient headroom, and the seats were not as comfortable nor as well spaced as in present equipment. The chassis of these coaches still may be in good running condition or can be made so at small expense, but the bodies for various reasons, are now not so well suited to modern requirements. Of course, operators serving a large territory can transfer some of these coaches to the suburban towns, or they can be kept ready for emergency service in the event of breakdown of the regular equipment.

The New England Transportation Company was confronted with this problem some time ago, and now has converted 22 of its older coaches into motor trucks, which they have found to give very satisfactory service. The procedure has been to make necessary repairs to the chassis and convert the front end of the old coach body into a cab by cutting it off back of the driver's seat and building a partition to close the opening. The part of the body not used for the cab is removed and a new truck body, built to fulfill the requirements of the freight trucking service of the company, is installed.

Some such method of extending the useful life of these vehicles is highly desirable from the standpoint of reducing the cost of operation. If, after three years of service as a motor coach, the chassis can be used three years more for truck service, the yearly rate of depreciation can be reduced substantially.

Where a choice of service is given, other things being equal, the public will quickly transfer its patronage to the company having the most modern equipment. Operators who give only motor coach service must sell their old equipment for whatever they can get, but the railroads, due to their manifold requirements, can, by using this equipment for freight service, keep their depreciation costs low and, what is more important, attract business by replacing it with modern equipment for their motor coach lines.

Motor Coach Versus Rail Motor Car

ONE of the questions which aroused extended discussion at the recent meeting of the Motor Transport Division at Toronto was as to whether the motor coach and motor truck will ever entirely supplant the rail motor car for the transportation of passengers, mail and express over branch lines where the available traffic is limited. One comment was that, as highway service has developed, it has been found increasingly difficult to find suitable places to use the smaller direct-drive rail motor car units. Mention was also made of the development of motor coach equipment, in effect a combination motor coach and motor truck unit, which provides for the transportation of approximately 30 passengers and makes available an adequate amount of space for a considerable volume of mail, baggage and express matter. The conviction was expressed by several that there is still and will continue to be a place for the larger rail motor car units, particularly those capable of pulling one or more additional cars.

Lack of suitably constructed and maintained highways makes highway operation as a substitute for rail operation impossible in many localities. This and other factors may delay temporarily, or even permanently, the replacement of present rail motor car operations with motor coach service. However, more improved roads are being constructed each year, and, as stated, motor coaches designed to handle a considerable volume of traffic of all kinds, such as has been handled in branch line passenger trains, are on the market. Furthermore, the experience of the railways in general has been that motor coaches can be operated at a cost considerably less than the cost of operation of rail motor cars, and furthermore, that motor coaches are more attractive to passengers than the rail equipment.

There is no justification at the present time for a prediction of the abandonment of rail motor car operation by the railways. On the contrary, for certain purposes rail motor cars will probably be used more widely in the future than they are now. However, experience has shown a number of roads that motor coach equipment is now available with which they can furnish more economical and effective branch line service than they are now furnishing with trains and rail motor cars, and for this reason, a steady increase in the operation of motor coaches substituted for branch line rail service may be anticipated.

FORM 66

COLUMBIA TERMINALS CO.

Defect Report

Vehicle No._____ Make _____ Capacity _____ Date _____

Chauffeur _____ Time _____

LIST DEFECTS BELOW	CAUSE

Name of Party Taking Report

Repair Record

MECHANIC	WORK DONE	HOURS	RATE	AMT.
	TOTAL LABOR			

Parts Used

PARTS PURCHASED	COST	PARTS FROM STOCK	COST
		TOTAL PARTS	

Repairs Completed: Date **Time** **Total Cost $**

Shop Clerk

A Complete Maintenance Record Is Made on the Defect Report, Showing Defects, Making of Repairs and Charges for Parts and Labor

FORM 111

COLUMBIA TERMINALS COMPANY

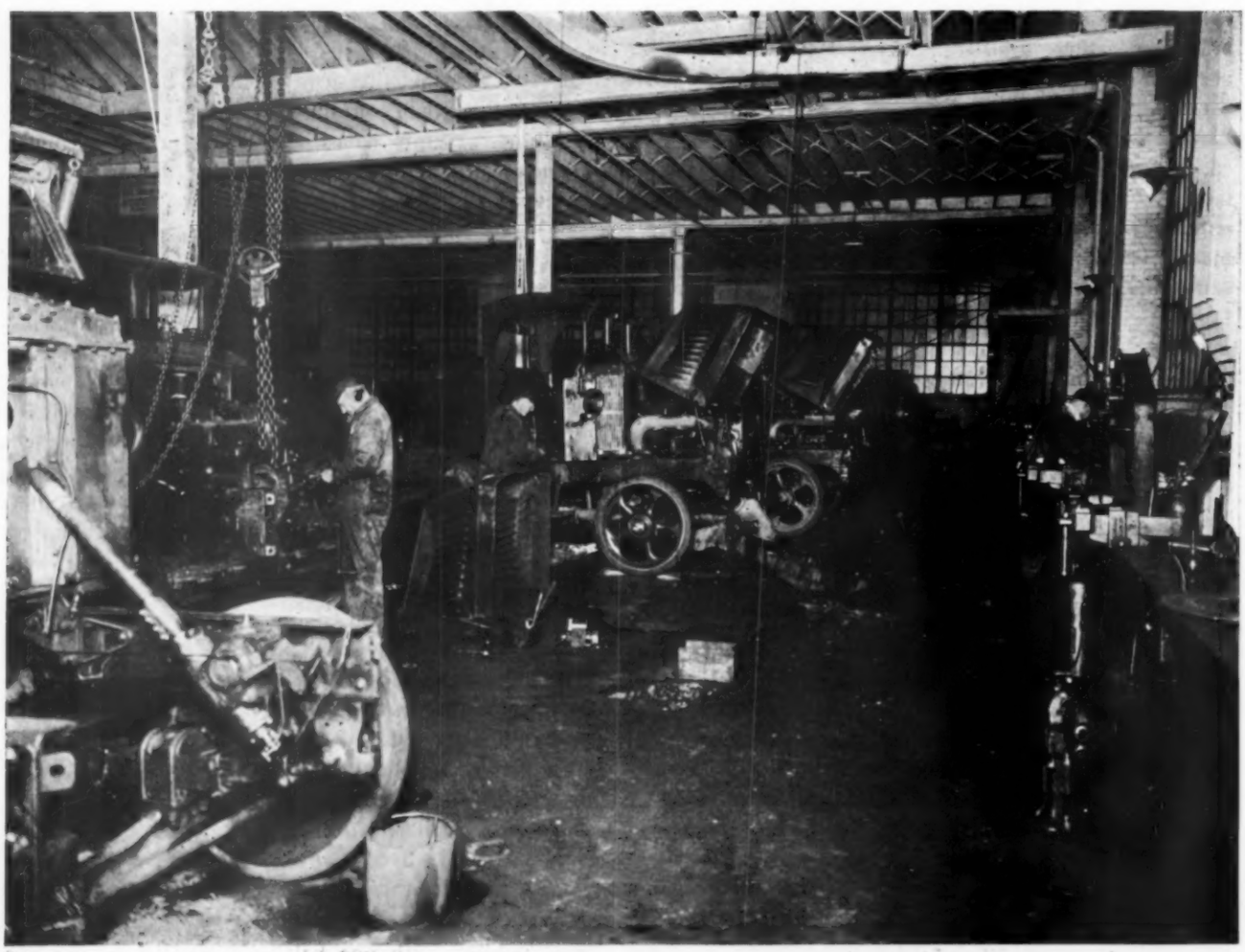
MOTOR REPAIR DEPARTMENT

VEHICLE NO. _____ DATE _____ 19 __

REPAIRS TO BE MADE

MECHANIC	TIME	WORK DONE
		ACCESSORIES
		FIFTH WHEEL
		MAGNETO
		TIRES

Work Done by Mechanics Is Indicated on the Repair Ticket of the Motor Repair Department, Which Provides a Record of the Mechanic Assigned, the Time Required and the Nature of the Repairs Made



One Side of the Repair Shop of the Columbia Terminals Company

Six Mechanics for 650 Vehicles

Columbia Terminals Company maintains tractor and trailer equipment efficiently with small force of men—bonus system secures co-operation of drivers

WITH a maintenance force of only six mechanics and one helper, the Columbia Terminals Company maintains efficiently its fleet of 106 tractors, 440 semi-trailers, 90 motor trucks and a few miscellaneous cars. This skeleton force of men, with the aid of three greasers, the drivers of the tractors and the foremen at the various freight depots maintained by the company keeps this large fleet of equipment in shape for the heavy, regular service required by the extraordinarily large volume of freight which the company handles. A bonus system, in which the drivers, the depot foremen and the division superintendents participate, is an important factor in the success of the company in maintaining its equipment in consistently good condition at the minimum cost.

The Columbia Terminals Company, acting as agents for the railroads entering St. Louis, Mo., and East St. Louis, Ill., operates a system of facilities for the handling of l.c.l. freight which amounts virtually to actual railroad service into and through the congested business districts of St. Louis. The company operates a number of universal inland or off-track freight stations, and has a large fleet of tractors and semi-trailers for the movement of freight between these off-track stations and the on-track stations of the railways in St. Louis and East St. Louis. Both inbound and outbound freight for the east side and west side railways is handled through these off-track stations. The volume of tonnage to be handled on each business day is so great that the maintenance of its equipment in condition for service is a basic essential of the company's operation.

The fleet of equipment used in the railroad contract work consists of 106 tractors and 440 Lapeer semi-trailers, including 10 6-ton semi-trailers, 429 9-ton semi-trailers, and 1 10-ton semi-trailer. Three garages are provided for the storage of tractor equipment at night, and the maintenance work is done in a 107 ft. by 120 ft. shop building. The company builds all of its own semi-trailer bodies, which are of the stake body type, and has special woodworking and painting departments in locations other than that of the shop itself. There is also a special department in which the canvas covers, for use on the trailers in wet weather, are made and repaired. The stake body trailers are preferred on account of the better ventilation in hot weather, and their adaptability to bulky loads. The canvas covers when properly adjusted provide adequate protection for the freight carried in the trailers on rainy or snowy days.

Trailers Ready for Loading at Eleventh and Spruce Streets Outbound Depot

Heavy Work Sent Out

The equipment in the principal shop consists of a lathe, a drill press, a forge and electric drills. Work requiring heavy machining and welding is sent out of the shop, as the company does not consider it economical, in so far as its own operation is concerned, to purchase such machines, in consideration of the small amount of use to which they would be put.

All maintenance work of the company is under the general supervision of Ben F. Weber, superintendent of the mechanical department. With a shop clerk as his only assistant, he has complete charge of the servicing and repair of the Columbia Terminals rolling stock, makes all purchases for the mechanical department and keeps all of the department records. In the main shop itself there are six mechanics, one helper, two greasers, and one porter. In addition two men are kept constantly on the street, greasing and oiling trailer parts. These employees are on day duty only. At night, a foreman and two men circulate between the three garages of the company—two in St. Louis and one in East St. Louis—oiling and greasing the tractor equipment. With the aid of two 125,000-lb electric grease guns, which are moved about on trucks, the greasing of a tractor is completed in 15 min., as compared with 4½ hours required to do this work ten years ago.

Nine-Hour Day for Mechanics

The main shop itself is open from 7 a.m. to 7 p.m., half of the employees starting at 7 a.m., and quitting at 4:30 p.m., with one half-hour for lunch, and the

Interior of Mechanical Department Garage

other half starting work at 9:30 a.m., and quitting at 7 p.m. The shop employees receive pay for the first two days of absence if they are away from work on account of sickness or for other cause, and are paid time and a half for overtime work. The company also gives each shop employee a week's vecation with pay, annually. Indicative of the satisfactory nature of the working conditions in the shop is the fact that no changes have been made in the personnel since January 6, 1926—nearly four years ago.

The basic factor which permits the small force of men employed in the Columbia Terminals shop is the policy of keeping all work out of the shop, except that which can be done only by trained mechanics. To accomplish this naturally has required education of the drivers in the care of their equipment. Each driver of the company is assigned a tractor of his own, and he is held responsible for its performance. No other driver ever uses it, and in case repairs requiring some time are necessary on a tractor, the driver is immediately assigned a reserve tractor, for which he is held responsible during the period it is in his charge.

Drivers Instructed in Simple Maintenance Work

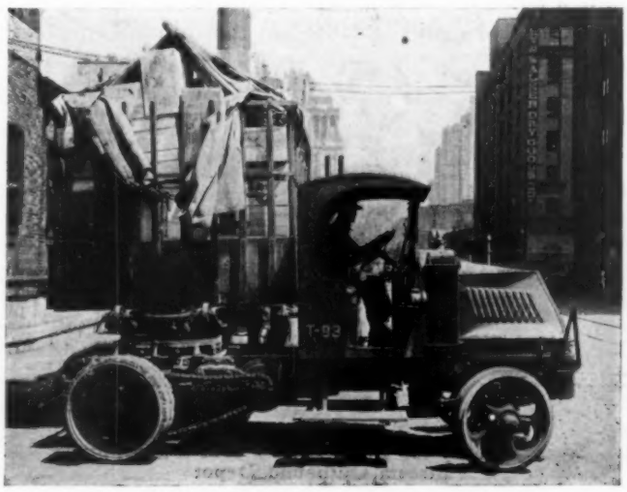
Previously the drivers were instructed not to attempt to do anything with their tractors in case of any kind of a breakdown. Then they were taught to call the shop for assistance, but now drivers are taught to perform simple maintenance operations themselves, and in most cases they are able to make minor repairs to their tractors without assistance, or to secure adequate instructions as to how to make these repairs themselves by merely telephoning the shop. This naturally saves a large amount of the time of the shop employees who formerly were kept busy running between the shop and the equipment on the road. Average calls per month of this kind from all sources number less than twenty.

The drivers are relieved of the oiling and greasing work, but they must check the oil float and the water and gasoline. At every spare moment the drivers clean their equipment and inspect it for defects. In case of a serious defect, the driver reports it on an appropriate form which goes with the equipment to the shop. Such forms are filled out for all work requiring the attention of a mechanic. Since the maintenance of schedules is the principal duty of drivers, they are given another tractor at once, if repairs to a disabled tractor cannot be completed within 15 minutes.

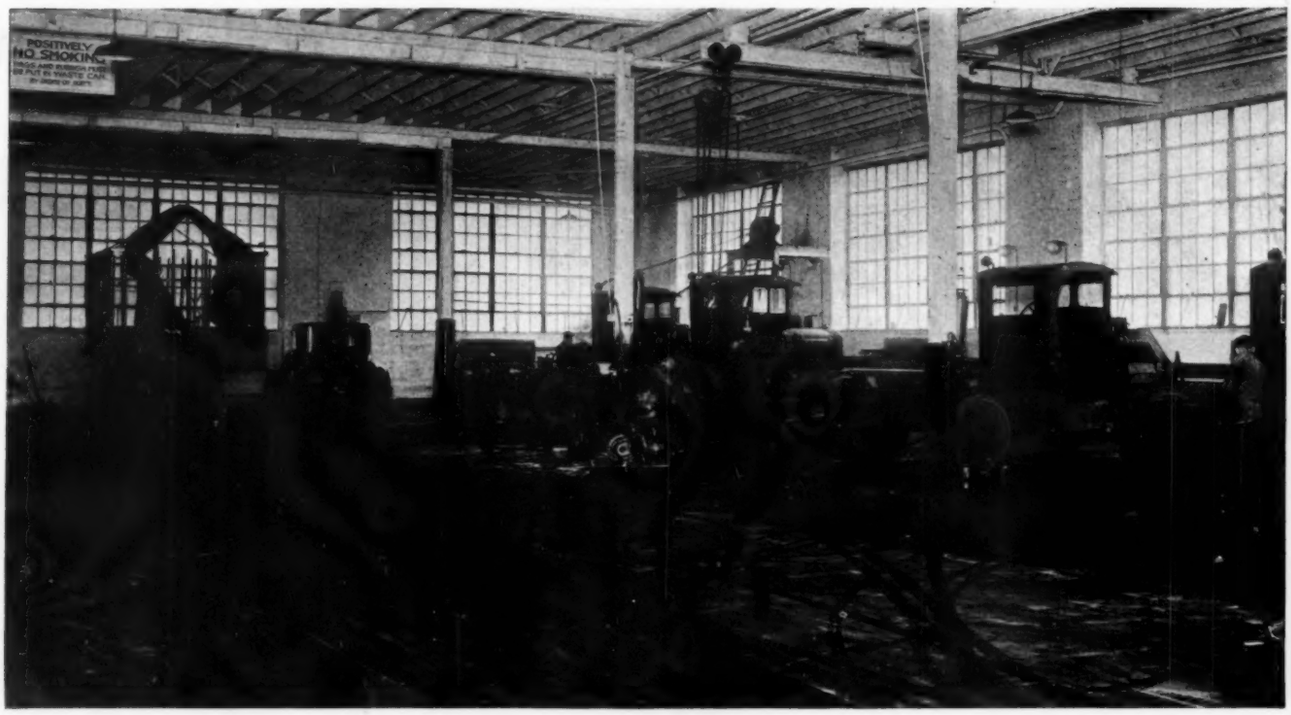
The company formerly operated on the basis of periodic inspections of its equipment, but its experience showed that such inspections required much unnecessary time. Repairs are now made when necessary, and drivers are held responsible for calling attention to the need for repairs. The men who grease the equipment also watch for "bad order" parts. Each tractor is greased once a week and the worm gears and transmissions are inspected every month. The latter are changed four times annually.

Depot Foremen Responsible for Trailer Condition

Just as the drivers are held responsible for the proper working condition of their tractors, so the depot foremen are held responsible for the working condition of



Tractors and Semi-Trailers Are Highly Maneuverable



Interior of Mechanical Department Garage

trailers assigned to their stations. The depot foremen constantly inspect the trailers at their stations and defective equipment is marked with a red tag. Since these men are vitally interested in the fast movement of freight to and from their stations, they will not take a chance on loading a trailer which they think may be defective. Consequently, they watch their trailers carefully, and call the shop at once if in doubt as to the working condition of the trailers. Reports are rendered daily on the work done on each trailer.

The secret of the success of the Columbia Terminals Company in operating as efficiently as it does and in securing the whole-hearted co-operation of all its employees in the proper operation and maintenance of its equipment, is the bonus system which it has in effect. The employees of the mechanical department do not themselves come under the bonus system but everyone else having to do with operations, including the division superintendents, depot foremen, drivers and helpers, are working under it. Drivers and depot foremen are paid bonuses on the basis of the tonnage of freight moved daily, while superintendents are paid bonuses depending largely on those drawn by their subordinates.

One of the Columbia Terminal Company's 440 Lapeer Semi-Trailers

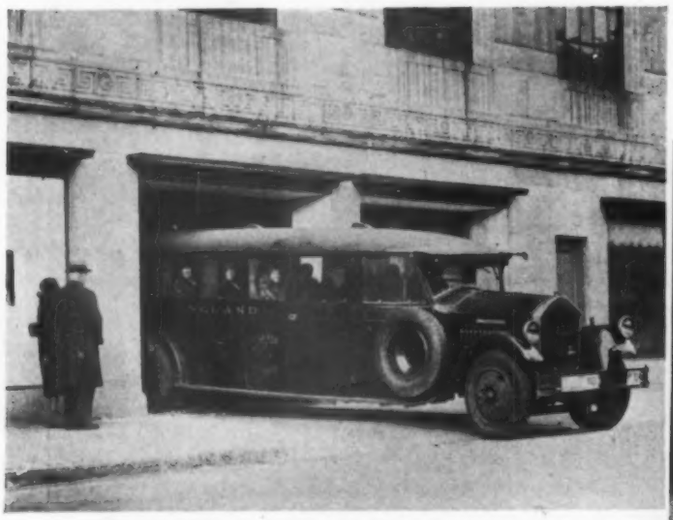
Bonus System Highly Effective

With this system in effect, it is natural that the drivers and foremen should be vitally interested in the performance of the tractor and trailer equipment, since the breakdown of a tractor or of a trailer naturally affects the tonnage which can be moved by a tractor to or from a freight station. The superintendents, too, are vitally interested in the performance of the equipment, because if the equipment is not kept in service without a breakdown, the drivers or depot foremen under their jurisdiction will receive smaller bonuses, and consequently the superintendents themselves will not get as much.

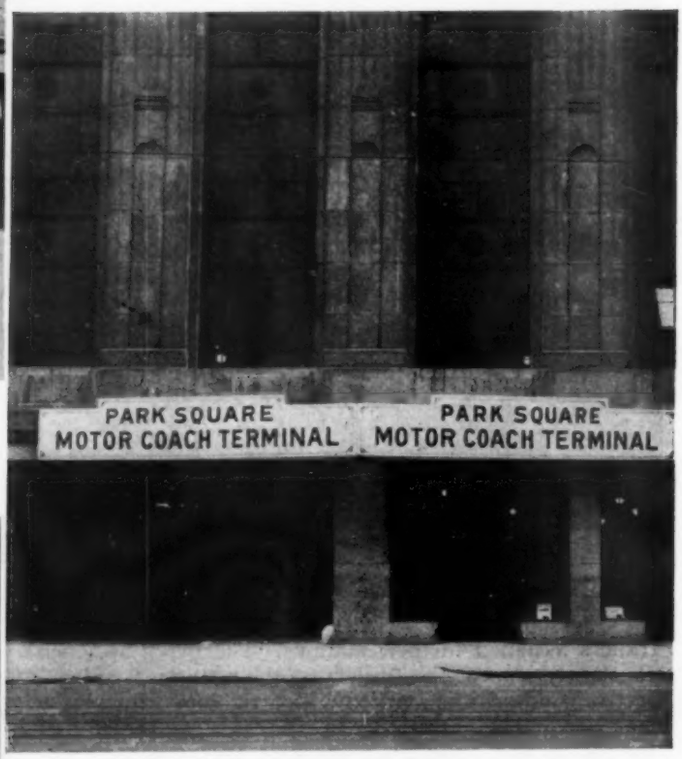
The conclusion of the Columbia Terminals Company is that the maintenance of equipment is a matter for which shop employees alone should not be responsible. .Recognizing that thoroughly maintained equipment is a prerequisite to successful operation, particularly when heavy tonnage must be moved speedily, regularly and economically, it has discovered in the bonus system a favorable means of securing the co-operation of all employees to keep the equipment constantly in working condition.

A TOTAL OF 7,400 MILES of federal-aid highway system was initially improved by the 48 states and Hawaii in co-operation with the Bureau of Public Roads, according to the annual report of the Chief of the Bureau to the Secretary of Agriculture. Initially improved highways are those upon which no federal-aid funds have previously been expended. At the close of the year initial improvements were in progress on approximately 8,358 miles and advanced stage construction was under way on 1,167 miles. The federal-aid system comprises a total of 188,857 miles of main interstate and intercounty roads. The total cost of the past year's improvement, including both initial and secondary construction work was $195,298,168.

New York-Boston



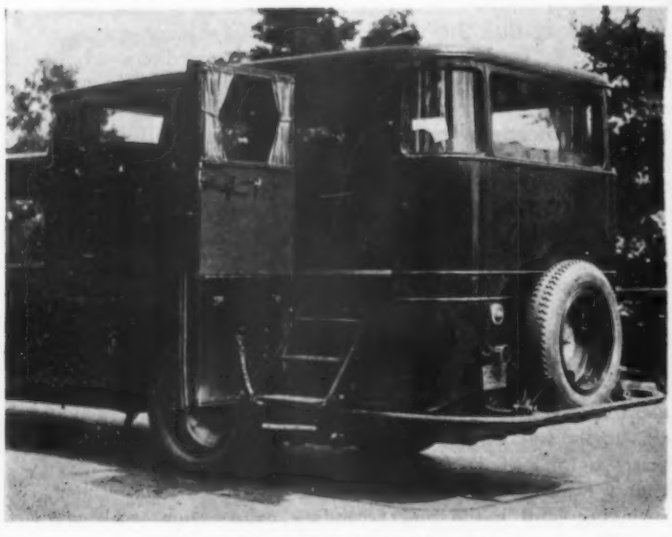
Coach Leaving Boston Terminal



Exterior of Park Square Terminal, Boston

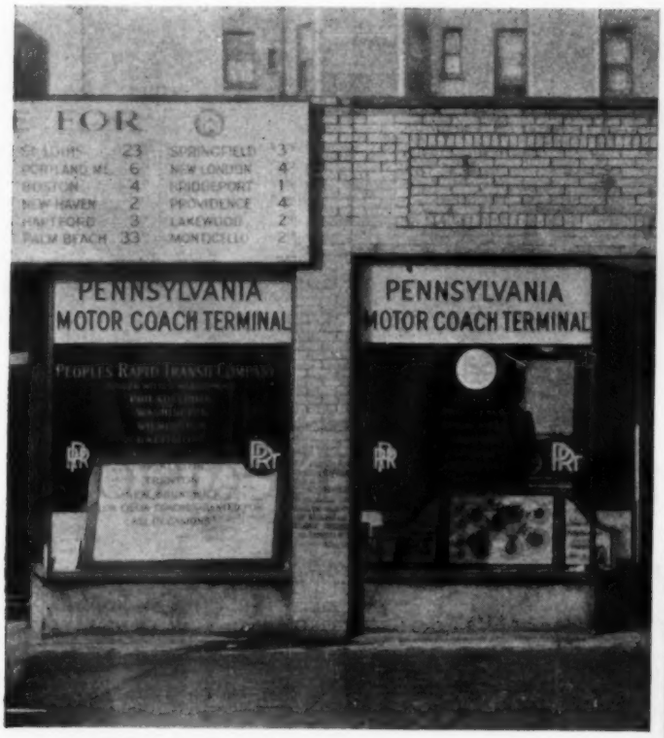
Along the Route in New York City

Interior of Park Square Terminal, Boston



View of Coach Observation Deck

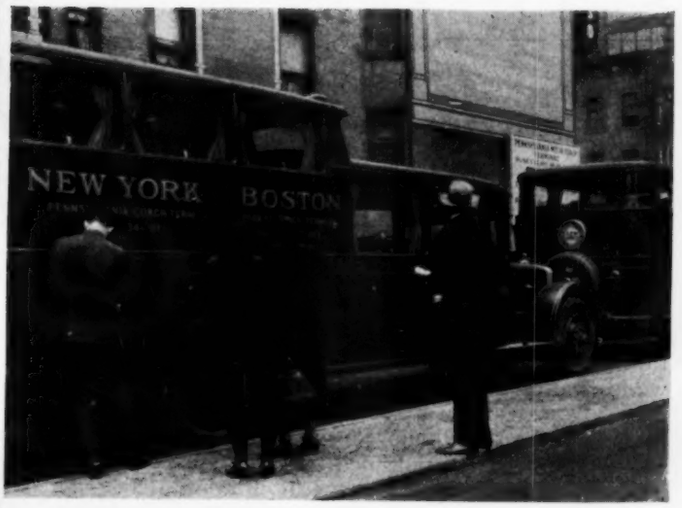
Service of N. E. T.



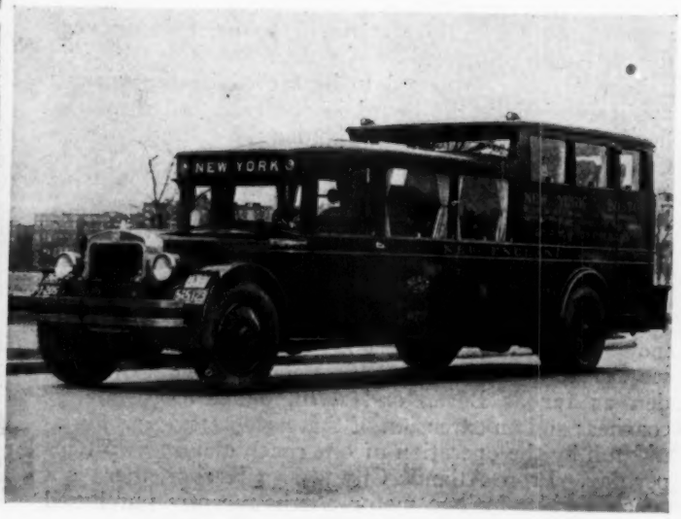
Exterior of Pennsylvania Terminal, New York

Interior of Pennsylvania Terminal, New York

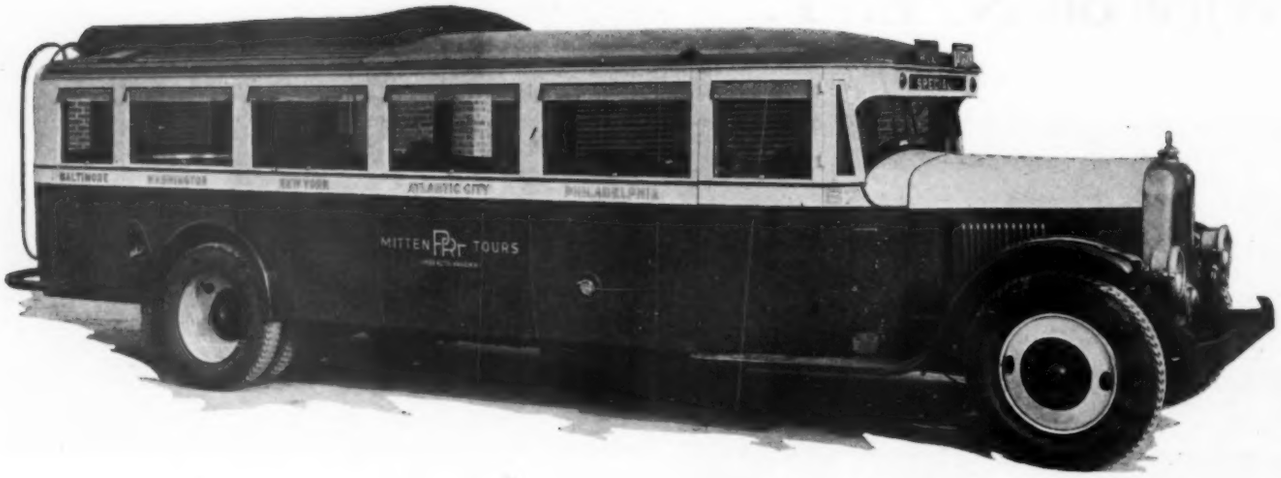
Passengers Boarding Coach at New York



Loading Baggage



One of the Parlor-Observation Coaches



Contest Atlantic City Route Decision

Pennsylvania files brief with New Jersey Supreme Court, asking reversal of utility commissioners' action on operating-right applications

IN a recent decision, the Board of Public Utility Commissioners of New Jersey refused to permit the Pennsylvania and the Reading to operate motor coaches in certain kinds of service paralleling their railway lines between Camden, N. J., and Atlantic City, while granting authority to several independent companies to provide such service. The railways have appealed to the State Supreme Court for a reversal of the decision. The brief filed by the Pennsylvania is a thorough discussion of the general question of the right of a railroad to protection from competition in its own territory, and the duty of a railroad to provide motor coach service supplementary to its railway service where it is demanded.

An abstract of the Pennsylvania's brief follows. Lack of space has necessitated the omission of numerous arguments and legal references, the brief being very detailed and complete.

The territory proposed to be served by the various applicants before the board in the case under review, lies in a direct line between Camden, N. J., and Atlantic City, 55½ miles. The two railroads, the West Jersey & Seashore, a subsidiary of the Pennsylvania, and the Atlantic City Railroad, a subsidiary of the Reading, and an improved highway, the White Horse Pike, run the whole distance.

Previous to these proceedings, there were a street railway service from Camden as far as Clementon; a motor coach service, now operated by the Public Service Co-ordinated Transport of New Jersey, out of Camden as far as Berlin and Atco, operating 12 motor coaches; and an extension of that coach service to Hammonton by the operation of one coach making two trips per day. From Atlantic City to Egg Harbor, there is a coach service by one motor coach, recently purchased by the Public Service, making nine trips daily.

There are a number of interstate motor coach operations over the White Horse Pike from Philadelphia to Atlantic City, which pick up and discharge passengers from any point along the White Horse Pike to or from Philadelphia. Of these operations, the Parlor De Luxe Coach Company, the Union Bus Company and the White Way Tours (these three being united in the O. G. Schultz ownership and management), and the Reading Transportation Company have the same route, with slight variations, from Camden to Atlantic City. The People's Rapid Transit Company, of which the Pennsylvania owns 75 per cent, is in the territory and runs interstate coaches along this route.

The White Horse Pike is also the route followed in part by the Public Service coaches above mentioned and proposed to be followed by the Pennsylvania General Transit Company operation. The Public Service applied in this proceeding for permission to extend its Atlantic City-Egg Harbor Line to Berlin, connecting with its Camden-Berlin-Hammonton line.

Each of the interstate companies in these proceedings and each of the railroad subsidiaries applied to the board for permission to do an intrastate business between Camden and Atlantic City, and each applicant was given such permission by the board, although not to the full extent applied for.

Before the order of the board, there were two means for through travel between Camden and Atlantic City, with intermediate local service: the West Jersey & Seashore, and the Atlantic City Railroad. There was a local service from Camden to Clementon, furnished by the electric railway; local service from Camden to Berlin and Atco by Public Service coaches, and limited service on to Hammonton; also limited service from Egg Harbor to Atlantic City.

Under the present order of the board, there are eight transportation systems permitted to operate intrastate: the two railroads, rendering through and local service;

Has a railroad the right to protection from new competition in a territory which it has occupied and aided in development for years? Has a railroad a right prior to the rights of newcomers to provide additional and new kinds of transportation service when it is demanded by the public? Is it the duty of a railroad to provide its patrons with a new kind of service such as motor coach service, when a demand for it develops?

The Pennsylvania answers these questions, which are of great present interest, in the brief which is reproduced in part herewith.

their subsidiaries, the Pennsylvania General Transit Company and the Reading Transportation Company; the three "Schultz Management" lines, all rendering a through service from Camden to Atlantic City, with stops at Berlin and Hammonton to take passengers for Atlantic City, and vice versa; and the Public Service, by its connection at Berlin, doing through and local business.

The Pennsylvania General Transit Company and the Reading Transportation Company voluntarily agreed to accept restrictions against doing business between Camden and Berlin and between Absecon and Atlantic City for the reason that these are within the zones of local service centering in Camden and in Atlantic City respectively.

Railroads Developed Territory

The West Jersey & Seashore Railroad Company has been in operation between Philadelphia (via Camden) and Atlantic City for upwards of 75 years. It is an integral part of the Pennsylvania Railroad system, through stock control and management. This line between Camden and Atlantic City has been developed and its service improved until it is now one of the best equipped and one of the most efficient railroads operating in this country. This has meant expenditures running into millions of dollars for improvements in equipment and right of way. The Atlantic City Railroad Company also operates an up-to-date and highly efficient line between the same terminal points.

These railroads have contributed in a marked degree to the prosperity and upbuilding of the New Jersey Coast resorts on the Atlantic seaboard and to the growth of intermediate localities. Until the improved road program was put into effect by the state through the state highway commission, no common carriers operated over the highways in the territory under consideration, except the street railways in the vicinity of Camden. All of these improved roads are paid for by the taxpayers, among whom the railroads figure largely.

Railroad Revenues Declining

Owing to the increased use of private automobile and the development of the motor coach and its operation over highways, made possible largely through the taxes paid by the railroads, the passenger business and revenues of the railroad companies have been steadily declining for a number of years, nothwithstanding every effort by the railroad companies to regain their passengers through continually improved service and lowered fares designed to attract a greater volume of business.

Cannot Overcome Competition

There is no method of control of the privately owned automobile nor is such control expected, but the excellence of the through highway has invited common carriers to make use of it for the transportation of passengers in competition with the established railroad systems. They thus avoid the expense of providing and maintaining a right of way. The result is that the motor coach, using a right of way paid for by the rail-

roads, in a large degree, competes with them with a favorable cost differential that makes the contest a steadily losing one for the railroads.

Recognizing their responsibilities, as public transportation companies, to maintain their systems and service to meet public preference for transportation by motor vehicle, and believing that the operation of motor coaches over longer distances in the territory already served by the rail line is the legitimate function of the railroads and the only way to solve the competition problem, the Pennsylvania has organized, in order to recoup this loss of traffic in some measure, a subsidiary, the Pennsylvania General Transit Company, under its sole control, for the purpose of operating motor coaches in conjunction with its rail operations.

Want to Supplement Rail Service

This subsidiary corporation was the applicant before the commission for approval of local consents to operate a line of motor coaches over the White Horse Pike, serving Philadelphia, Camden and Atlantic City and intermediate points. This territory was already served by the railroads, and the coach service was planned to supplement their train service, with the idea of furnishing transportation to the public by motor coach at times when the amount of traffic is insufficient to justify the operation of trains, thus co-ordinating the existing rail operation, wherever practical, with motor coach operation, using the rail stations for the convenience and comfort of coach riders and providing facilities for making seat reservations and interchanging tickets.

The Pennsylvania General Transit Company, after securing local consents from municipalities between Camden and Atlantic City, applied to the Board of Public Utility Commissioners, avowedly as a motor coach operating subsidiary of the railroad, for the approval of these consents as required by statute. The Atlantic City Railroad Company, the subsidiary of the Reading Railroad system, through its subsidiary, the Reading Transportation Company, also applied for permission to operate motor coaches over the same route. Its situation is practically identical with that of the West Jersey & Seashore.

The Parlor De Luxe Coach Company, the White Way Tours and the Union Bus Company applied for approval of local permits to do an intrastate business along the Camden-Atlantic City route at about the same time as the Pennsylvania. These three companies are owned and managed by O. G. Schultz, who heretofore operated three interstate lines: Parlor De Luxe Coach Company, White Way Tours and Union Bus Company, between Philadelphia and Atlantic City over the same route, and one interstate line from Philadelphia, over the same route, to Ocean City, under designation of Parlor De Luxe Coach Company. These companies have heretofore done no intrastate business on this route.

Independents Have No Claim

The present application of these companies is in direct competition with the new facilities now offered by the subsidiaries of the railroads. They have never spent a dollar in the development of the territory nor in the creation and maintenance of a right of way, nor in the creation of a system. Some of their coaches they own, but some are leased. Their present facilities are required for their interstate operations. They have no claim, either legal or moral, on the board's consideration. The operation is sure to injure the railroads.

The Public Service Co-ordinated Transport has developed and operated a street railway system radiating from Camden. Prior to 1926, when the act was passed bringing all motor coach operations under the utility board, certain coach operations were started from Camden to Berlin, Atco and Hammonton. These routes were later purchased by the Public Service Co-ordinated Transport, or its predecessor, and thereafter operated by it.

In 1927, the Public Service Transportation Company applied to the board for approval of an extension of these routes—Camden-Berlin-Atco-Hammonton — to Atlantic City, and for permission to increase its service by the operation of 12 additional coaches to Hammonton and by 12 more coaches running through to Atlantic City. After the hearing and prior to the release of the decision, the Public Service Transportation Company purchased from one Lawrence a motor coach and permit in an operation from Atlantic City to Egg Harbor.

Competitor Given Exclusive Rights

The present application of the Public Service Coordinated Transport is for an increase of service from Egg Harbor to Atlantic City, and for a permit to extend its Egg Harbor-Atlantic City line to Berlin and connect up the two ends. Since the decision in the present case, this operation has been put in effect, and the Public Service is operating and advertising a Camden-Atlantic City service by connecting coaches at Berlin.

The present decision gives to the Public Service Coordinated Transport the exclusive right to do a local business; that is, business between intermediate stations throughout the whole district from Camden to Atlantic City.

The decision of the Board of Public Utility Commissioners that the municipal consents of the Public Service Co-ordinated Transport for the extension of the Egg Harbor-Atlantic City route to Berlin, N. J., and for the operation of 5 coaches on the Berlin-Atlantic City route; of the White Way Tours, for the operation of 3 coaches between and including Camden and Atlantic City; of the Parlor De Luxe Coach Company, for the operation of 3 coaches between and including Camden and Atlantic City; of the Union Bus Company for the operation of 4 coaches between and including Camden and Atlantic City, via Pleasantville, are necessary and proper for the public convenience and properly conserve the public interest; and that the municipal consents of the Pennsylvania General Transit Company and of the Reading Transportation Company for the operation of 15 coaches, each, between and including Camden and Atlantic City, in both local and express service, and also the rendering of any local service by motor coach by the Pennsylvania General Transit Company and the Reading Transportation Company are not necessary and proper for the public convenience and do not properly conserve the public interest, is erroneous in law.

"Public Convenience and Necessity"

The power of the Board of Public Utility Commissioners over municipal consents to operate motor coaches is delegated and defined by Section 24 of the Act Concerning Public Utilities. Under this section, the Board of Public Utility Commissioners must give its approval to any privilege or franchise, "when . . . such privilege is necessary and proper for the public convenience and properly conserves the public interest." Section 24 does not give the Board the power to grant or withhold its approval arbitrarily but sets up a standard to which the board must conform. The standard set up by the legislature is the standard of public con-

venience and necessity. It is for the court to determine by construction the legislative intent in the terms so used.

The order of the Board of Public Utility Commissioners violates rights guaranteed to the prosecutor by the Constitution of the United States. If the state is authority for arbitrary action on the part of the board, restricting the natural rights of the owners of property for the extension of their business according to its natural growth, and for the protection of the existing business by meeting competition with competition, the statute is in violation of the Fourteenth Amendment to the Constitution of the United States. Arbitrary and unreasonable regulation of a public utility constitutes a deprivation of property without due process, in violation of the Fourteenth Amendment to the Constitution of the United States.

Equal Rights Refused

The board in many instances, and in a series of consistent decisions, has sustained the right of existing transportation companies to supply the facilities in a given territory and to be protected from destructive competition so long as they are ready, able and willing to meet the requirements of the public convenience and necessity. The board has deprived the prosecutors of the equal protection of the laws by denying them the same right and the same privilege which it has granted to other transportation companies under the same or similar conditions.

The board in its decision says: "The evidence indicates that in these applications the petitioners are at the present time conducting an interstate business between points in New Jersey and Philadelphia, Pa., and that some of the companies under the O. G. Schultz Management were pioneers in this method of transportation. The railroads, having permitted local transportation by motor coaches to develop without objection, cannot now be heard to object to the extension of facilities to meet the demands of this kind of street transportation. The character of the service proposed to be furnished by the railroads will be express service in the nature of railroad service; therefore, the board will permit the railroads to supplement their railroad service with motor coach service, but it does not consider that their willingness to do so should preempt the territory against other lines which have been carrying on interstate and intrastate service previous to the railroads' proposed motor coach operation."

Error in Logic, Law and Facts

In so saying, the board erred in logic, in law and on the facts. The board specifically finds that the White Way Tours, the Parlor De Luxe Coach Company and the Union Bus Company are engaged in interstate transportation over the Atlantic City-Camden route. These coaches have never carried on any local business and they have never hitherto had consents to carry on local business.

These three companies began to operate an express service between Philadelphia and Atlantic City, doing an exclusively interstate business subject to no regulation whatever. By reason of the unfortunate state of federal legislation, there is no regulation of the interstate motor coach business. That it is needed, everybody admits. That the competition of interstate coaches is injurious to railroad business is self-evident. But there is this saving grace in that situation: namely, that the railroads may, without hindrance, meet competition with competition and protect themselves after the manner of ordinary business organizations. This they have done as to interstate operations. The Pennsylvania Railroad Company has a 75 per cent interest in the People's Rapid Transit Company, which operates interstate coaches between Philadelphia and Atlantic City on this route.

Railroads Have Objected

When the board says that the railroads have permitted the independent coach operations to develop without objection, it makes a misstatement which injures the railroads. The railroads have done the only thing which they could do to defend themselves. And it is for the first time, in this proceeding, that they have been able to object before any public body to the operations of the interstate coaches who are now seeking to broaden their business to include intrastate carriage. There is no principle of law that failure to object to one motor coach line at one time stops a railroad from objecting to another and different coach line at another time. Such a rule would be highly onerous and contrary to the principles and the practice of our government. Had the railroads been lax in asserting their rights, so that a coach line had actually been put in operation over this territory and large sums of money invested in reliance upon such failure to assert rights, a different situation would have been presented. But here, none of the operators had engaged in intrastate business between and including Camden and Atlantic City and if the railroads had been lax in objecting to any other operations, no parties to this action would have suffered by the assertion of their rights in the case at bar.

As to the entry of Public Service Co-ordinated Transport into the territory, the evidence shows that Public Service Co-ordinated Transport has not been supplying service between Hammonton and Egg Harbor and consequently has not been operating over "the entire route located between Camden and Atlantic City." The board in its decision stated: "The board is satisfied that the Public Service Co-ordinated Transport should continue to provide the local transportation service over the entire route located between Camden and Atlantic City." The finding of the board is contrary to the facts as shown by the evidence.

Public Service a Newcomer Also

The existing operations (local and limited) were established by other operators as a suburban service between Camden and Hammonton, and between Atlantic City and Egg Harbor. Public Service Co-ordinated Transport bought the Egg Harbor-Atlantic City line while decision was pending in its application to extend the Camden-Atco route to Atlantic City, decided July 17, 1928. It has operated one coach on this line. At the hearing before the board on the extension of the Camden-Atco line, a representative of the Public Service stated that their chief purpose in asking for the extension, which was subsequently denied, was to obtain a foothold in the territory on which to base rights to operate on the White Horse Pike. Public Service is then a newcomer in this territory.

The railways have been supplying all the station-to-station service to the communities along the Camden-Atlantic City route for a generation, prior to the invention of the street car and the automobile. They have been responsible in large measure for the growth and prosperity of this section of the state. Without them, these communities would have been isolated and many of them would never have come into existence.

This section of the state cannot dispense with the railroad at this time, and it is difficult to predict when,

if ever, all of the transportation needs supplied by the railroad can be fully and equally well supplied by other means. With these facts before it, the Board of Public Utility Commissioners has, by its decision in the case at bar, permitted Public Service Co-ordinated Transport to extend its lines and reach into new territory with a type of service never hitherto rendered by it in this territory or any part of it. It has permitted this newcomer to connect its recently acquired suburban routes so that they form a complete chain from Atlantic City to Camden, carrying interuban and through traffic in competition with the railways.

The rule of law is that an existing railroad has the right to supply all of the service in the territory in which it is operating, to the exclusion of all who seek to enter the territory, so long as it is ready, able and willing to supply the service required by the public necessity and convenience as determined by the Board of Public Utility Commissioners.

Morally, the railroads are entitled to protection because they have served this territory for generations before any other service was available and are still indispensable to this section of the state. A duty is imposed upon them to continue to render the service which they have been rendering for so long. They are prohibited from entering other territories, in competition with the utilities there operating, by the established law and policy of the state. They are subject to the regulation of their rates. They have been deprived by the state of a portion of their freedom to contract. It is unjust to deny them protection from competitors who will usurp the cream of their business and who are unable to supply all the service which the territory requires. Especially grave is this injustice in view of the offer of the railroads to supply all of the transportation, of whatever character which may be required by the public convenience and necessity, in the territory served by them.

Railroads Entitled to Protection

Legally, the railroads are entitled to such protection because the statute which gives the board jurisdiction was enacted for the very purpose of supplying it and was in itself an announcement of the policy of the state; because all other utilities similarly situated are thus protected; and because it is written into the fundamental law of the land that all who are in the same situation shall receive the same treatment and none shall be unjustly deprived of property or the enjoyment thereof. To permit free competition with the prosecutor by the motor coach operations of the other applicants herein, while continuing to impose a duty to serve and a restriction upon its own entry into competition with other carriers in other fields, is a virtual confiscation of railroad property.

Behind and beneath the law are broad economic principles to which no court or administrative board may shut its eyes. Economic stability and the security of investments are essential to the welfare of the state and its people. The railroads constitute a great industry in which billions of dollars are invested. This private wealth has been dedicated to a service "affected with a public interest." Onerous restrictions are placed upon the free manipulation of railroad properties in order that the public may be well served. The railroads are deprived of their freedom to compete when and as they see fit. This is in the interest of the public, because competition has been shown by a century of experience to serve the public badly. Nevertheless, the railroads are private property. The investment is endangered by the competition of other forms of transportation. The railroads' hands are tied. They cannot strike out as other enterprises can, to recapture the business which is essential to their continued existence, unless the Board of Public Utility Commissioners approve.

Under the decisions of the Board of Public Utility Commissioners and of the courts, they may not enter new territory in competition with a carrier already there. Therefore, they must have preserved to them, free from competition, the territory which they are now serving, in order that a great state may not be deprived of a great industry before its usefulness has passed, and in order that thousands of investors may feel secure that when they dedicate their property to the "public interest," the public will in turn safeguard their investment. If this feeling of security is removed, funds, indispensable for public utility enterprises, will not be available, and our whole system of quasi-public corporations will be broken down.

The three interstate operators, the Parlor De Luxe Coach Company, the Union Bus Company and the White Way Tours are entitled to no consideration or preference as against the applications of the railroad subsidiaries, the Pennsylvania General Transit Company, and the Reading Transportation Company, and the board should not, in view of the above situation, have approved municipal consents for their intrastate operation.

The Public Service Co-ordinated Transport is entitled to continue service in the local territory in which it has heretofore been operating, and which is its legitimate transportation field. But, in view of the fact that it has never operated the whole length of the White Horse Pike or through service from Camden to Atlantic City (notwithstanding the statement of the board to the contrary), and that the railroads have heretofore solely served the territory between Hammonton and Egg Harbor, the Public Service Co-ordinated Transport should not have had its municipal consents approved for the territory between Hammonton and Egg Harbor, when the Pennsylvania General Transit Company and the Reading Transportaiton Company are ready and able to continue to serve this territory by supplementing their rail service with motor coach service.

* * * *

On the Los Angeles & Salt Lake

Trends in Motor Truck Design*

Modern design is balanced between the transportation requirements of the vehicle and the available materials of construction

By B. B. Bachman
Vice-President, Engineering Division, The Autocar Company

THE general characteristics of motor truck design are tending gradually toward the same general principles as are followed in the design of passenger cars. Models of ten years ago were equipped with either a two or a four-cylinder engine, but in present production the two-cylinder type has entirely disappeared, and in the last year or two the six-cylinder engine has been fitted to an ever increasing number of models because of the improvement in roads and the increased use of pneumatic tires. Both of these factors have made possible definite increases in speed, and this creates the necessity for more power. To provide it by enlarging the cylinders introduces disadvantages, but these can be eliminated by increasing the number of cylinders.

While the possibilities of the fuel-injection type of oil engine are attractive, the general availability of gasoline and the relatively low price which has prevailed have not been favorable to fostering the development. In consequence, little or no interest in this type is shown at present by either users or manufacturers.

The principal mechanical and operating troubles which develop result from the demand for high engine speeds. These manifest themselves in rapid wear of main and connecting rod bearings, burning of valves, erosion of valve seats and wear of pistons and piston rings. Increasing the engine power and lowering the engine speed by using lower gear ratios in the rear axle relieve this condition considerably. Provision of force-feed lubrication to all bearings and the use of filters to clean the oil have made a definite improvement in bearing life. It also has been found that reducing the stroke of the pistons has tended to produce greater stiffness in crankshafts, which together with stiffening the crankcase and providing heavy studs and bearing caps has increased bearing life.

Improved materials have been made available. The characteristics of valve springs have been investigated, and this has resulted in improvements in design that have eliminated valve surge. The design of water passages in the cylinders has also been improved, particularly around the exhaust valves, which has resulted in better cooling. These improvements, together with the use of chromium and nickel as alloys in cylinder iron, promise to overcome the valve troubles previously experienced.

The Piston Problem

Piston and piston-ring wear has not been successfully prevented. No single design has operated with universal satisfaction, because of the many conflicting requirements. A division of opinion still exists as to the relative merits of aluminum and cast iron as piston material. The provision of adequate lubrication, the maintenance of uniform and fairly high operating temperatures, the installation of air-cleaners, and the use of hard cylinder bores made of alloy iron have proved beneficial, but the problem is still unsolved. Improvement in uniformity of gasoline quality has fostered the raising of compression pressures. Compression ratios are generally from 4.5:1 to 5:1.

Change-speed gears are in a period of transition. Generally, the four-speed selective type is used on models up to 4000 lb. capacity; models of larger capacity are fitted with five and seven-speed transmissions, the latter requiring an additional control lever. Some models are fitted with an additional two-speed transmission in series with the main transmission, mounted, in some cases, ahead and in others back of the main transmission. In any case, these are all expedients to afford the possibility of reducing engine-speeds and maintaining a higher car speed, while still providing large gear reductions for emergency use.

Bearings in transmission cases are of antifriction ball or roller type, except for the reverse idler gear; and designs are now appearing in which this gear also has roller bearings, particularly in vehicles that are to be used in road or building construction, in which work the space limitations require the vehicle to operate extensively in reverse.

Trends in Rear Axles

The rear axle is one unit that varies considerably on different models. For vehicles up to 3000 lb. capacity, the single bevel gear-set is generally used. The housings are either of pressed steel or are cast of malleable iron or steel. The mounting of the gears is similar to that for the conventional passenger car axle. The gears are of the spiral type, although one model using the hypoid gear has been offered during the last year.

On heavier models of from 3000 to 10,000 lb. capacity, the worm gear, internal gear and double reduction gear are used. The worm-gear axle has been used so generally that it needs no description. It is simple and quiet in operation, its efficiency under normal conditions is satisfactory, and, with the later developments in materials and production methods, it gives excellent results if properly designed and not excessively overloaded.

The internal-gear axle has been used extensively but is passing out for various reasons, the most important being undoubtedly the tendency toward the use of pneumatic tires, with which there is insufficient room inside the wheel to provide for an internal gear of adequate size and for the necessary housing and brakes.

The double-reduction axle is becoming more popular because it is very efficient, provides excellent ground clearance, the gears operate in a bath of lubricant and are housed and protected against dirt, and the performance and durability are good. When made with straight-tooth gears, difficulty is experienced in obtain-

* From a paper presented before the Society of Automotive Engineers, Transportation Section, at Toronto, Ont., on Nov. 13, 1929.

ing satisfactory quietness, but the use of spiral-bevel gears improves this condition considerably, and one maker has used herringbone gears for the spur set, with good results.

On vehicles of more than 10,000 lb. capacity, the chain drive still remains popular, although a number have the worm-drive axle. In this heavy-duty service, the chain drive has much to recommend it, although it suffers from such short-comings as excessive noise and the difficulty of obtaining satisfactory lubrication; on the other hand, the worm-gear axle has unsatisfactory ground clearance and does not withstand abuse so well.

Front Axles and Other Parts

Front axles follow conventional practice. The tendency toward the use of brakes on the front wheels is slowly taking form, and this will require the use of the reversed Elliot-type axle, as it has done on passenger-cars. As the use of pneumatic tires is increasing, further improvement in steering facilities is needed. Some work has been done on power steering, but nothing definite has yet been developed.

The depth of frame sections is increasing, and heat-treated alloy steels are being used to provide greater stiffness and strength. Greater stiffness is desired to provide proper support for fully enclosed bodies of the panel type, and greater strength is demanded because of the higher speeds made economically possible by pneumatic tires.

Provision for adequate brakes is a problem of the greatest importance and difficulty, and the use of pneumatic tires has affected it most critically. The use of dual rear tires is imperative in some cases and, with legal restrictions on the width of the vehicle and the need of sufficient spread of the springs and frame, the brakes must be placed inside the tire. Keeping the vehicle height down creates the demand for the use of minimum wheel diameters, and this limits the diameter of the brake drum, which increases the pressure necessary to obtain the needed braking effect and limits the surface available for heat dissipation. The use of power-operated brakes on the larger vehicles is virtually a necessity, but the form of the operating power mechanism is still in question.

Experiments with cast brake-drums and molded brake-linings are producing promising results, and they probably will prove more satisfactory than metal-to-metal brakes. Although air-operated brakes have been used on motor coaches, they have not been adopted for trucks because the equipment needs an amount of attention which is not generally available for trucks even in fleets. The vacuum booster has been used extensively for power operation and gives very good results, and improvements are being made in the design of the unit and its application.

Future Trends

The future probably will see a further increase in engine sizes and an increasing use of six-cylinder and possibly eight-cylinder engines, to meet the need for greater average road speed without such a great increase in maximum speed. Such a requirement calls for more power to provide more rapid acceleration and sustained speed on hills.

Improvement in brakes and the use of four-wheel brakes will naturally follow this increase in speed. Greater protection for the operator, more comfortable seats, and easier operation of the steering gear and controls also will be demanded, together with better riding quality and smoother and quieter engines, transmissions and rear axles.

Saving $2860 A Month*

By Frederick C. Horner
Assistant to Vice-President, General Motors Corporation

CO-ORDINATION of the motor truck and the railroad in terminal service is well exemplified by the Long Island Railroad trucking operations handled under contract by the Motor Haulage Co. of Brooklyn, N. Y. This railroad was faced with a serious problem arising from delay and congestion within its four metropolitan terminals, each of which made up a peddler car for each of the various branches; in other words, each station was loading a car for, say Mineola, N. Y., which meant that four lightly loaded cars were hauled to that point daily, the traffic for which could easily have been loaded into one car. In addition this also meant that four peddler cars were being handled at the Holban Yards Transfer where the facilities were already overtaxed.

Delay and congestion were the result of the operations, and something had to be done to relieve the situation. The remedy was the consolidation of freight at specific stations so that more through cars could be made and peddler cars on each train be reduced to the minimum number.

The motor truck offered a means to eliminate this delay and the yard congestion by using the highway to connect the various terminals. The actual operation in this particular instance has resulted in having one car carry the tonnage of four. To do this, highway trailers are stationed at each of three stations and transport the freight originating there to a centrally located terminal.

In one month, with one tractor and six trailers in operation, 1629 tons of freight was handled between the Long Island City, Pier 22 and Flatbush Avenue stations and the Bushwick terminal. About 300 freight cars would have been used for this service. According to the railroad's own figures, the cost to move these 300 cars to their destinations through the yards, including 4 days' per diem charge, would have been $6,747. Against this amount is charged the hire of motor equipment, the cost of the second handling at the terminal and supervision, making a total charge of $3,855, leaving a net saving of $2,860 per month.

Indirect Savings

The indirect savings, although they cannot well be translated into money value, should be taken into consideration. To be definite, they are:

(1) Savings in floating cars across the East River.
(2) Reduction in the number of cars that have to be handled from the terminal stations to Holban Yard, resulting in a saving of per diem charges and cost of movement.
(3) Saving in yard operations, such as engine time, labor and similar items, at Holban Yard.
(4) Reduction of delays to trains en route by reason of fewer cars to be opened at each station.
(5) Increase in the capacity of the railroad to handle passenger business, due to the reduced amount of time of line occupancy by unremunerative or slightly remunerative freight service. This is especially important to the Long Island Railroad with its heavy passenger train operations.
(6) Reduction of the detention of freight moving within or through the terminal area from one to four days.
(7) More room for additional cars at transfer platforms.
(8) Reduction of the number of cars in the daily set-up resulting in heavier loading of destination cars and fewer peddler or way cars.

* From a paper on "The Application of Motor Transport to the Movement of Freight" read before the World Motor Transport Congress in Tokyo.

Training Apprentice Repairmen

How the Railway Express Agency trains younger men for motor vehicle repair work

IN response to requests of their employees who wanted their sons to have an opportunity to learn a good trade, the Motor Vehicle Department of the Railway Express Agency in New York City initiated an apprentice training program. A contributing factor in the establishment of this plan was the difficulty of securing skilled mechanics who could do the work required of them without a long and expensive period of breaking-in.

The course of training has been developed around the ideal of providing a type of training which would find its practical application in the every-day work of the truck repairman and nothing is taught that is not a common problem of the better class of mechanics employed in the company's shops. The ratio of apprentices to mechanics never exceeds 1 to 10 and at the present time there are eleven apprentices and two hundred mechanics in the New York district.

Two grades of men are taken into the course: First, the apprentice who has had no previous trade experience and has usually just finished school; and second, the helper apprentice who has had at least two years automobile shop experience in an express agency shop. The prospective apprentice must be between the ages of 17 and 21 and must have had at least a grammar school education. He must be physically fit and of neat appearance, and must satisfy the superintendent that he has sufficient interest in the trade to complete the course of training. The helper apprentice must have the same qualifications except that he should be between 19 and 25 years of age.

An indication of the popularity of the course with the students and the organization as a whole is given by the fact that at present there are pending sixty applications for entrance. Preference is given to the sons of employees and to mechanics' helpers who have been with the company two years or more. Attendance is carefully checked, and the schedule of both regular and helper apprentices requires a minimum of 260 days and a maximum of 290 days of labor per year, with no overtime and no Sunday or night work permitted. The minimum requirement of 260 days per year gives the apprentice 17 days for sick leave or vacation, but if he works on Saturday afternoons, his vacation can be extended a proportionate number of full days.

The course includes instruction periods on the company's time, and shopwork in which the student works in different departments as a mechanics' helper. The regular apprentice shop training takes four years to complete and is given in the following order: One year on the overhaul of gasoline trucks, including work on all major units; one year on the overhaul of electric trucks, working on all units except batteries; one year in the machine shop on general lathe work and simple jobs on the shaper, milling machine and drill press; six months on the electric garage floor making minor repairs on motors, controllers and wiring, including the daily care of batteries and the operation of the charging board; and six months in the gasoline truck garage doing minor repair work which includes tuning up motors, checking timing, cleaning carbon and grinding valves, and changing brake shoes. Part of the machine shop period is spent in the blacksmith shop. Part of the last six months' period is spent in the electrical department and is devoted to making repairs to magnetos, generators and starters.

The helper apprentice shop course covers the same work in three years. It has been found that his two years of shop experience as a helper enables him to grasp more quickly the principles involved, and enables him to complete the same work in one year less time. When the apprentice starts his course, he must arrange to attend an outside trade school at night or one of the city night schools or some technical institute for at least two years. He can take up any study he may wish, but he is urged to confine his efforts to those which find everyday use in the automobile repair shop. This outside school work helps to impress upon the student the fact that he is taking a complete course of training and that he must apply himself while he has the opportunity. He must make a satisfactory grade in this school work to keep in the shop course. At the present time the apprentices' outside studies include machine

Fitting Connecting Rod Bearings

shop practice, drafting, automobile principles, automobile electrical work and shop mathematics.

It is compulsory that the apprentices attend the shop classes every Tuesday afternoon from 4 P.M. to 5:30 P.M. At the beginning, instruction is given in shop mathematics and blue print reading, but later the instruction follows closely the shop work that the apprentice does during the day. With this plan the student has an opportunity to learn the fundamentals of the work he is doing from day to day, and can ask any question in the shop class that he cannot learn from the foreman or mechanic with whom he has been working. This paralleling of the shop and class work is considered a fundamental part of the course.

The instruction in mathematics includes: fractions and decimals and conversion of one to the other; the use of steel rules and the reading of all scales; measuring with inside and outside calipers; measuring with inside and outside micrometers; measuring with micrometer cylinder gage and use of beam trammels on chassis frame. The maximum time allowed to complete this work is three months. Upon passing a written examination the apprentice advances to the next class. Blue-print reading is taught, covering the way a blueprint is made, the use of reduction scales, the meaning of conventional symbols, full and hidden lines, screw threads, turning and grinding limits, allowance for finish and electric wiring diagrams. This must also be completed within three months. If the apprentice fails to grasp the instruction in mathematics and blue-print reading within the maximum time limit, he is requested to resign as showing no aptitude to learn.

Bench Work Instruction

Bench work is taught next, starting on the proper use of the hammer and cold chisel, cape, diamond point, half round and other types. At this point the apprentice makes his own chisels and is taught forging, tempering and drawing at the forge under a competent blacksmith. An oblong block of cast iron is given the student who must bevel the edges, and a block of soft steel must be cut square. Old connecting rod bearings are used for oil grooving instruction with the round nose chisel, and also keyway cutting, internal and external, teaching the proper depth and width to be cut. The proper use of the hacksaw is taught, as are round, straight beveling and draw filing on all materials. Templets for gear teeth are filed from sheet metal, and a right angle corner fitting is made of 16 gage sheet metal. Flat scraping, using old flywheels, and roughing, finishing and burnishing of babbitt bearings is included. The use of the drill press, feeds, speeds and stops, and the grinding of drills for working special materials completes this course.

The next course covers the machine shop, with eight months on the lathes and four months on the milling machine, shaper and grinding machine. Most of the time is spent in making special tools which, at the end of the course, are the property of the apprentice. Some of the tools made by the present class are shown in an accompanying illustration. Throughout this course, simple operations of machining and fitting on motor parts, clutches, transmissions and steering posts are given. Those who show more than average ability in this course are given two months instruction on acetylene and electric welding.

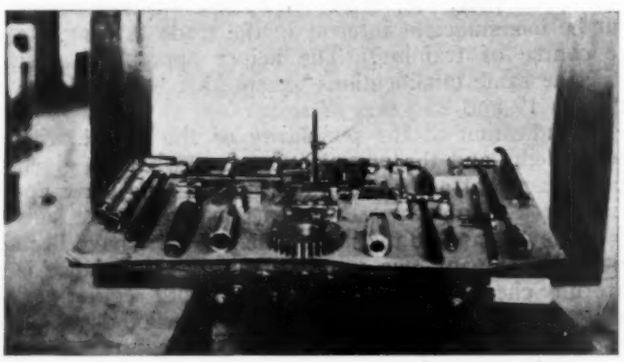
The final course of six months covers carburetor adjustment and overhaul, and electric starting, lighting and ignition systems. The text books used are Kaup's Machine Shop Practice; The Gasoline Truck and The Electric Truck, by E. E. La Schum; and How to Run a Lathe, by the South Bend Lathe Company. During the period of instruction, talks of fifteen minutes are given by the foreman or superintendent on new products, recent mechanical changes in the equipment owned by the company, or on any subject considered of interest to the class as a whole.

Rates of Pay

The pay of the regular apprentice is 43½ cents per hour for the first six months, with 2½ cents per hour increase every six months. The helper apprentice is paid 63½ cents per hour for the first six months, with 2 cents per hour increase every six months. Since the course was started, 64 have been enrolled, and at present 29 are still with the company, indicating a mortality of approximately fifty per cent. The history of the enrollment in the course has been as follows:

	Regular Apprentice	Helper Apprentice
Total Number Enrolled	36	28
Left Before Finishing	15	10
Finished and Left	5	5
Finished and Still Working	8	10
Not Finished and Still Working	8	3

The course has been carried on without interruption for eleven years, and the company believes it to be decidedly worth while, as it has been found from experience that the training given develops a type of mechanic that cannot readily be secured in other ways.



Tools Made During Machine Shop Instruction Period

Test Carbon Deposits in Motor Coach Engines*

Show carbon depositing tendencies of high carbon paraffine, low carbon paraffine and naphthene lubricating oils

By C. J. Livingstone, E. C. Martin and S. P. Marley
Mellon Institute of Industrial Research, Pittsburgh, Pa.

EXTENSIVE studies of carbon deposits in automotive engines have been made with a view to establishing any possible connection between the properties of lubricating oils and the conduct of these oils in use, particularly with regard to carbon deposits. The summarized data on total mileage covered, oil consumption, number of ports cleaned, and average of miles per port clean-out are given for the three groups of vehicles, each on a different oil, in Table 1.

Table 2 gives comparative figures for the amount of obstruction at each port inspection. These have been obtained by using a planimeter on the port diagrams, the areas blocked off by carbon in all ports of each vehicle at the inspections being added together to give a total carbon-area figure for that motor coach throughout the test. This has then been expressed as the percentage of total available area that was covered by carbon throughout the test for that vehicle. After averaging for the six vehicles in each group, the carbon area per motor coach per 10,000 miles traveled was calculated. This figure was converted into a percentage of the total port area per vehicle covered by carbon during 10,000 miles of operation. Obviously, the ports were cleaned when more than one-half of their port area was closed.

Table 1.—Summary of Test Data

Motor Coach No.	Total Distance Run, Miles	Oil Consumption, Qt.	Ports Cleaned
High-Carbon Paraffine Oil			
2	6,143	390	30
3	7,980	373	24
6	8,239	353	24
25	8,595	251	30
33	10,999	416	36
42	9,555	395	20
Total	51,506	2,178	164
Average		94.6 a	314 b
Low-Carbon Paraffine Oil			
4	9,898	193	28
24	11,090	295	20
36	11,270	452	24
41	7,676	292	34
45	10,004	521	24
46	10,652	435	21
Total	60,540	2,197	151
Average		110 a	401 b
Naphthene Oil			
1	9,691	383	9.5
5	10,254	384	9.5
26	10,725	483	5.5
34	10,790	376	5.0
37	8,860	427	6.5
39	8,710	348	2.0
Total	59,030	2,401	38.0
Average		96.5 a	1,556 b

a Miles per gallon of oil.
b Miles per port clean-out.

The number of motor coaches involved in the test and the time and distance of operation as shown in Table 1, appear to be sufficiently great to iron out the irregularities to be expected in the operation of automotive equipment. Table 1 shows also that oil consumptions for the three oils are sufficiently close to preclude any masking of results from this cause. From this table also may be seen the general trend of the results, which is brought out in the figures for miles per port clean-out under the data for each group of vehicles on each oil. For the high-carbon paraffine oil, this average is 314 miles per port clean-out; for the low-carbon paraffine oil, the figure is 401 miles; and for the naphthene oil, 1556 miles. This indicates a very marked superiority of the naphthene oil over both paraffine oils. The significance of the figure for miles per port clean-out can be pictured as follows:

If the miles per clean-out be multiplied by 6, the number of ports in each engine, a comparative figure will be obtained to indicate the distance an engine could operate on each oil without cleaning. For the high-carbon paraffine oil, it is 1884 miles; for the low-carbon paraffine oil, 2406 miles; and for the naphthene oil, 9336 miles.

The significance of Table 2 rests on the three figures

Table 2.—Comparative Figures for Port Obstruction

Motor Coach No.	Total Area of Carbon, Sq. In.	Port Area Covered, Per Cent
High-Carbon Paraffine Oil		
2	34.96	62.4
3	26.80	60.8
6	20.32	45.2
25	34.73	62.0
33	41.23	62.4
42	25.80	58.2
Total	183.84	
Average	30.64	59.0
Per 10,000 Miles	35.7 c	324
Low-Carbon Paraffine Oil		
4	31.99	58.2
24	27.49	61.9
36	32.55	59.0
41	33.88	51.0
45	22.33	50.3
46	28.68	52.2
Total	176.88	
Average	29.46	55.0
Per 10,000 Miles	29.2 c	266
Naphthene Oil		
1	11.51	20.8
5	15.44	27.8
34	9.26	21.1
37	10.36	19.0
39	3.79	8.7
26	19.07	34.6
Total	69.43	
Average	11.57	22.5
Per 10,000 Miles	11.8 c	107

c Per motor coach.

* From a paper presented before the Society of Automotive Engineers, Transportation Section, at Toronto, Ont., on November 15, 1929.

for percentage of port area closed by carbon per 10,000 miles of operation. These indicate that, with the high-carbon paraffine oil, the entire port area would have been completely closed over more than three times during the 10,000 mile run. For the low-carbon paraffine oil, the port area would have been closed more than two and one-half times over the same distance. For the naphthene oil, however, the area would have been closed only once. Approximately the same figure for the naphthene oil was obtained from the miles-per-port-clean-out relation given in Table 1, in which the comparative figure for complete closure is 9336 miles. Another interesting point is that, with the naphthene oil, 9 ports went through the entire distance without any cleaning and 14 were cleaned only once.

The present results with sleeve-valve engines bear no perceptible relation to carbon-residue values. Two difficulties are thus apparent; first, to establish the significance of the carbon-residue test for engines in general, and, second, to find a test that will choose oils which are satisfactory for sleeve-valve engine use. The second has seemed the easier task.

The construction of the ports in a sleeve-valve engine is such that the carbon deposited is subject to erosion by the exhaust gases. A soft, fluffy carbon will not have much opportunity for accumulation. A heavy, sticky carbon, on the contrary, will build up in a very short time. Any deposit will decrease appreciably the gas flow through the port, and the deposit will augment itself rapidly. In other words, the process of deposition increases progressively after the manner of a snowball rolling downhill.

The suggestion has been made that a decrease in the port area, as by carbon deposits, should increase the speed of the gas-flow through the ports, tending thus to erode the deposit. When a dense and adherent deposit has formed, this effect is not noticeable; with the naphthene oil, however, several cases were observed in which a deposit present at one inspection had been materially reduced at the next. The tests with the three oils in a laboratory poppet-valve engine indicated that the most adherent and densest carbon was deposited by the high-carbon paraffine oil; this oil, correspondingly, required the most clean-outs in the motor coaches. The low-carbon paraffine oil gave carbon deposits that were somewhat softer than those from the high-carbon oil, and gave slightly better performance in the vehicles than did the latter. The carbon from the naphthene oil was definitely different from that of either of the two other oils, being soft and powdery. Correspondingly, the motor coach results from this oil were strikingly the best.

Such conclusions as can be drawn, while tentative, are clear. The carbon-residue test is a fairly reliable index of carbon deposition in a poppet-valve engine, other conditions being rigidly the same. Of 17 oils listed, 15 give fair agreement with a straight-line relationship to the carbon-residue test. Its success is most conspicuous in evaluating paraffine oils. The setting in oil specifications of reasonable upper limits for carbon-residue values in the same viscosity class should protect the user from excessive carbon deposits, because a paraffine oil of low carbon-residue value must be very highly refined; a naphthene oil, always of low carbon-residue value, has an inherent tendency to low carbon-deposit. In either case, the user will by this means be protecting himself against any abnormal carbon-deposition.

For sleeve-valve engines, the situation seems to be different. A paraffine oil of very low carbon-residue value was only slightly better as to carbon deposits than one of normal carbon-residue value, and both were very strikingly inferior to a naphthene oil. The characterizing of such a naphthene oil seems possible best by a vacuum-distillation specification. A tentative recommendation might be that such oils, in addition to being otherwise suitable should show at least 90 per cent volatility when distilled under 10-mm. pressure, and should boil between suitable limits of liquid temperature, these to be set for the equipment in mind. For the motor coach engines used in this work, these limits might be between approximately 500 and 700 deg. Fahr. at 10-mm. pressure. Probably 5 per cent could be allowed to distill over below the lower temperature limit. Other suitable upper and lower limits must perhaps be set for other types of sleeve-valve engines.

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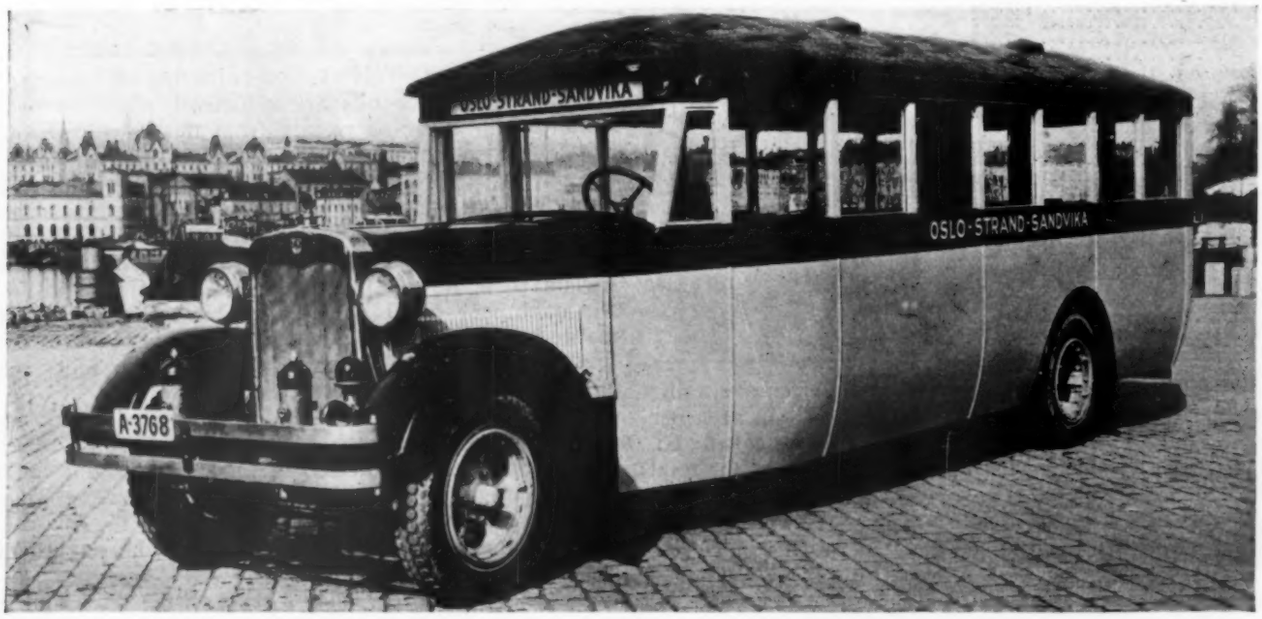


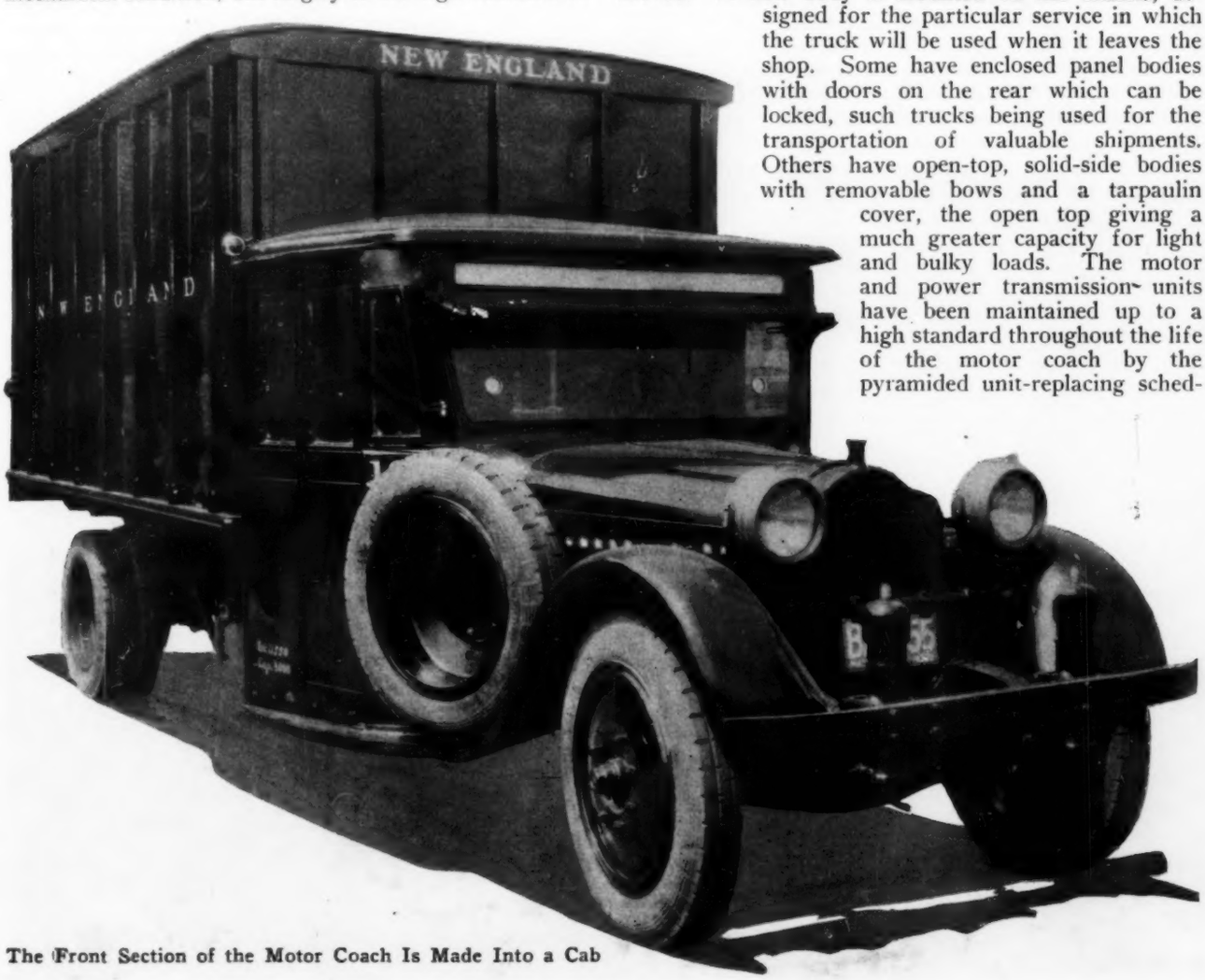
Trucks from Rebuilt Motor Coaches

Passenger equipment requiring extensive body repairs is reconstructed and used for highway freight service

THE New England Transportation Company, like several other motor coach companies which have been operating for several years, has found that vehicles purchased three years ago or longer have been made less attractive to passengers by recent advances in design. A 3 year old motor coach, if it has had the proper maintenance, is still good for several thousand miles of service so far as its mechanical condition is concerned, but the body may present problems of fundamental nature which will necessitate complete rebuilding. Several of these older bodies do not have the proper head room, and the seats are not as comfortable as those of later design and construction. The chassis have four-cylinder power plants and brakes operating only on the rear wheels. These undesirable features have been eliminated from the modern motor coach, and the public does not hestitate to show its preference for the service of the company using the most modern equipment.

Recently, the New England Transportation Company had several of these older coaches which were in good mechanical condition, due largely to the high standard of maintenance which is a policy of the company, but the bodies were either of undesirable design or were due for complete rebuilding owing to the condition of the frame work. It was decided to cenvert them into trucks as an experiment, which turned out to be so satisfactory that up to the present time 22 have been rebuilt in this manner.

The procedure has been to cut off the body back of the driver's seat and build in a new partition making an enclosed cab from the front section of the old body, the roof, doors, steps, floor, windshield and dash remaining in place. The partition forming the rear of the cab is made of 4 in. by 1½ in. oak strips, placed vertically on 18 in. centers, with intermediate horizontal braces spaced 12 in. apart. This frame is covered with 14-gauge sheet iron, securely fastened to the edge of the old body to make a storm-proof joint. The partition has a window properly placed so that the driver can see through the body to the rear. The roof is re-covered if necessary, and the marker lights and destination sign are removed. A new body is mounted on the chassis, designed for the particular service in which the truck will be used when it leaves the shop. Some have enclosed panel bodies with doors on the rear which can be locked, such trucks being used for the transportation of valuable shipments. Others have open-top, solid-side bodies with removable bows and a tarpaulin cover, the open top giving a much greater capacity for light and bulky loads. The motor and power transmission units have been maintained up to a high standard throughout the life of the motor coach by the pyramided unit-replacing sched-



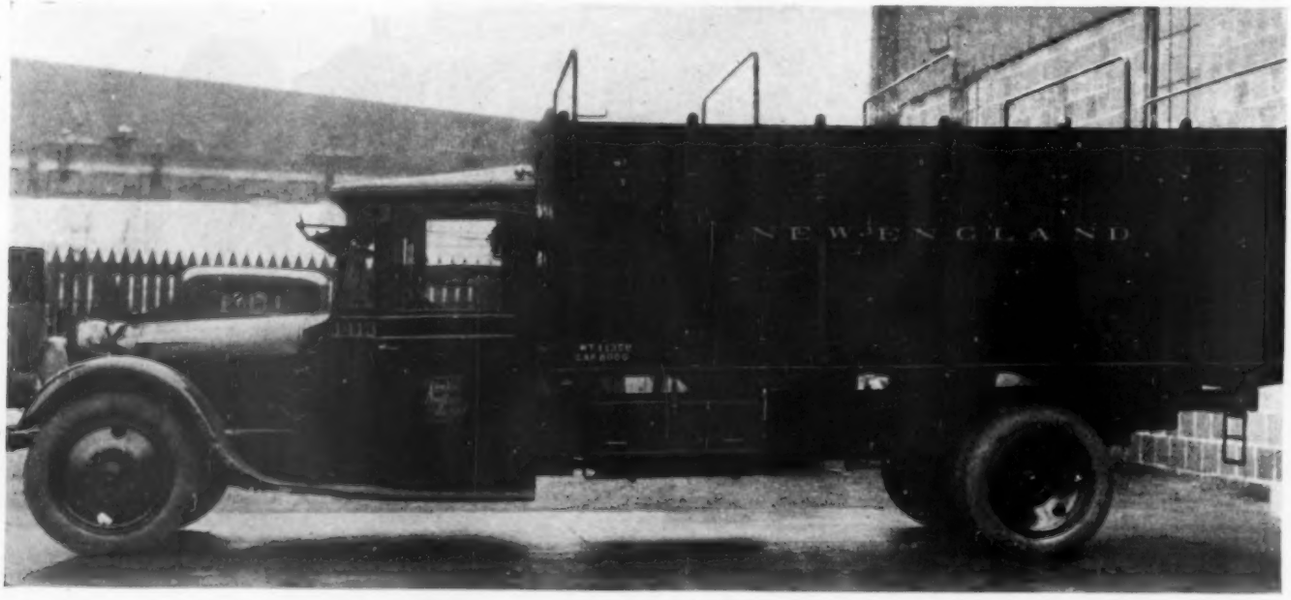
The Front Section of the Motor Coach Is Made Into a Cab

Model A B Mack Motor Coach Rebuilt for Use in the Highway Freight Service

ule upon which the maintenance of all equipment owned by the company is based. This system provides for periodic inspection and overhaul of each unit at a predetermined mileage and when a unit is scheduled for repairs it is replaced by another unit which has been completely overhauled. For this reason no additional service or alteration is required to be made to the important units at the time of rebuilding and the same unit-replacement schedule is continued in the truck service. All springs are reset and three or four additional leaves are put in to give the necessary load capacity with minimum spring deflection. The gas tank is relocated and properly protected by sheet iron splash aprons with the filler opening placed where it is not liable to be damaged. The battery is placed inside the cab so that it will be better protected and more readily available for inspection, and the charging rate of the generator is reduced.

In certain cases the load distribution resulting from the relative position of the cab, body and rear axle, as proportioned by this method, would not be desirable and would result in unusual stresses in the frame. In such cases the rear axle is moved forward to the proper position. Where the character of the pay-load is predetermined and the load distribution indicates that certain sections of the frame will be severely stressed, a reinforcement is used. This consists of an inserted steel plate which is securely clamped in place and drilled. It is then hot riveted and welded to the frame. The same tires and wheels are used, and it has not been found necessary to alter the pinion and ring gear ratio.

Dents are removed and necessary repairs are made to the hood, headlamps and front fenders. Heaters and pipes are removed and the valves are permanently closed. The same steering gear and driver's seat are used, their relative positions remaining as they were. All of these rebuilt chassis have been placed in operation in the rapidly expanding highway freight service of the system and, up to the present, have been found to give very satisfactory results.



Model 50-A White Motor Coach Chassis with Open Top Rack Body

New Equipment

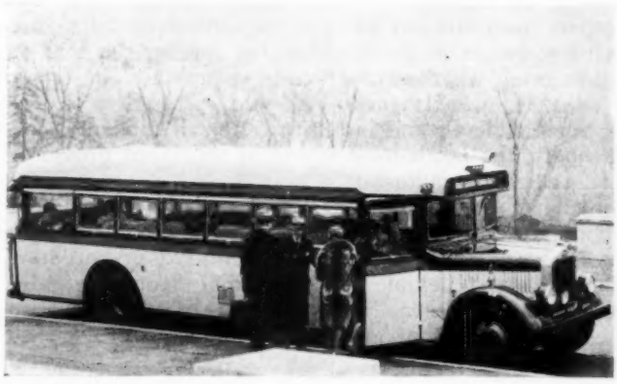
White Builds Club Coach

IN response to the trend toward more luxurious motor coach equipment, the White Company, Cleveland, O., has developed a new club coach in which are embodied numerous features contributory to the utmost comfort in highway travel. This motor coach has been designed particularly for handling charter traffic and for operation over regularly scheduled routes in extra fare service. The body, built by the Bender Body Company of Cleveland, is mounted on the 6-cylinder Model 54-A White chassis.

The seating capacity of the coach is 25, with an extra seat provided for a porter or conductor. Overhead racks have been installed which provide ample space for any hand baggage accompanying the passengers. The rear of the coach is of full observation design, with the window extending the full width of the body. Pullman type roller curtains and a non-shatterable glass are provided throughout as regular equipment.

The club coach of the White Company is distinctive particularly for its interior fittings and appointments. Instead of the ordinary motor coach seats, five full-sized lounges and two half-lounges, all overstuffed, are provided. A writing desk and a radio cabinet are other novel features, the writing desk being located midway of the length of the body at one side, and the radio cabinet opposite it. Candlestick lights are mounted above each lounge, and are silver finished. Magazine racks, food cabinets and shelves for carrying candy, cigars and cigarettes are other novel features provided.

Any color scheme desired can be furnished in the all-metal interior.



Exterior of the White Club Coach, a Special Bender Body Mounted on a Model 54-A Chassis

Interior of the New White Club Coach, Equipped with Over-Stuffed Lounges, a Writing Desk, a Radio, a Magazine Rack and Other Fittings in Tune with the Luxury Note

Mack Offers Model B C Truck

THE latest addition to the line of motor vehicles manufactured by Mack Trucks, Inc., New York, is a six-cylinder, heavy duty, high speed motor truck of 2½ to 3 tons capacity. Designed to have a margin of power in excess of older models of this capacity, the model BC makes possible higher average speeds without sacrificing economy of operation. Through proper co-ordination of the transmission units, this extra power is made available for pulling the load in rough going where slow speed is required. The frame is made of special heat-treated alloy pressed steel of 8 in. vertical depth and is reinforced with tubular cross-members, the bottle-neck layout at the front providing a short turning radius.

Some of the interesting features of the six-cylinder engine are: a combined fan and water pump mounted at the front of the cylinder block; crankcase ventilation provided by a flexible tube extending from the valve cover plate to the carburetor intake; throttle control of the exhaust heat applied to the inlet manifold; and thermostatic temperature control. When the temperature of the engine drops below 150 degrees, no water circulates and circulation does not begin again until the temperature rises above 175 degrees. The lubrication system operates under a pressure of 55 lb. per sq. in. and extends to main, connecting rod and camshaft bearings, all oil passing through an H-W filtrator.

With a bore and stroke of 3¾ in. by 5½ in., giving a piston displacement of 365 cu. in., the B C engine develops 100 horsepower at 2400 r.p.m. The compression ratio is 4.8 to 1. The cylinder block and head are single castings, and the combustion chambers in the head are offset to give greater turbulence to the fuel mixture. Pistons, of low expansion aluminum alloy, are fitted with three plain rings and one oil scraper ring, all located above the piston pin. The connecting rods are made of drop-forged molybdenum steel of tubular cross-section and are machine finished all over with the connecting rod bearings direct-babitted and diamond-bored to a diameter of 2½ in.

The counterbalanced crankshaft is mounted in seven main bearings, 3 in. in diameter, and the camshaft is mounted in four bearings, 1¼ in. in diameter. The valves are located on the right side of the engine and have flat seats. The inlet valve is made of chrome-nickel steel and the exhaust valve of chrome-silicon steel. A mechanical vacuum-booster fuel pump is mounted on the crankcase on the right side of the engine and forward of the carburetor. The 12 volt North-East electrical system includes a distributor, which is located on top of the cylinder head between the third and fourth cylinders. A vibration damper is mounted on the front end of the crank-shaft. The cooling system consists of a tubular fin-type radiator with manually controlled shutters. The clutch on the new model is of the single plate, dry type, with the clutch housing and transmission bolted to the crankcase to form a unit power plant. The transmission, of standard Mack design, has four speeds forward and one reverse, with fourth speed direct drive. The gears and spline shaft are case-hardened, and the transmission has a bolted-on filler spout, tire pump mounting, power take-off and countershaft extension.

In the B C model, extensive use is made of rubber shock insulation, and all spring tips, the radiator, steering column and the cab incorporate this style of support. The front axle is of I-beam design with reversed Elliot-type steering knuckles, and the final drive is by a dual-reduction type rear axle with full floating axle shafts. All springs are made of special alloy steel and are semi-elliptic. The front spring is 42½ in. long and 3 in. wide with 12 leaves, and the rear spring is 56 1/16 in. long and 3½ in. wide, with 11 leaves.

The foot brakes, augmented by a vacuum booster, operate mechanically on all four wheels and are of the internal expanding type. The center drive shaft support carries the hand brake assembly, which together with the service brakes gives a total braking area of 750 sq. in. Alemite high pressure chassis lubrication is used throughout. The steering gear is of the worm and sector type in which the worm is ground to insure a perfect fit, and has an eccentric adjustment for sector wear. A 35-gal. gasoline tank is located under the driver's seat, with a filler spout projecting through the right side of the cab. Steel spoke wheels are standard equipment. The two standard wheelbases are 154 in. and 172 in., with a special length of 190 in. available at extra cost.

Mack Three-Ton B C Truck Chassis

General Motors Increases Capacity of Model T-60 Trucks

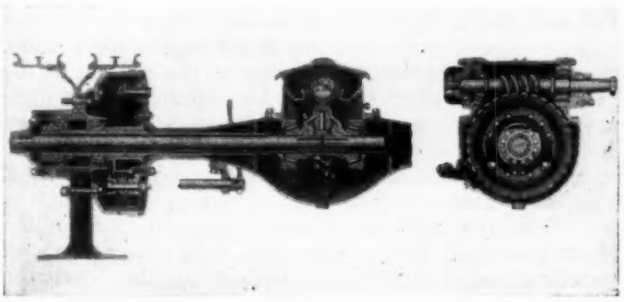
EIGHT special new chassis types of the model T-60, featuring heavier worm drive rear axles, two stage rear springs and larger tires, have recently been announced by General Motors Truck Company, Pontiac, Michigan. The result of these improvements has been to increase, by 3,500 lb., the maximum allowable gross weight which can be carried on the truck. The two-stage type rear springs have several advantages over the single rear springs previously used, namely, the main spring provides easy riding under light load conditions and, when carrying heavy loads, the auxiliary spring functions to assist the main spring in providing increased stiffness. The addition of the auxiliary spring assists in counteracting objectionable sidesway or leaning when going around curves or on slanting roads with a load having a high center of gravity.

Four chassis lengths are available: 140¾ in., 160¾ in., 180¾ in. and 200¾ in., each of which may be equipped with 36 in. by 8 in. single front and dual rear, or 38 in. by 7 in. single front and 38 in. 9 in. dual rear pneumatic tires. The maximum allowable total gross weight with the 8 in. tires is 19,000 lb., and with the 9 in. tires 22,000 lb. One standard gear ratio of 10.33 to 1 and two optional ratios of 9.00 to 1 and 12.33 to 1 are available. The rear axle is the worm drive type with axle shafts of chrome-nickel steel. Four wheel service brakes are of the 3-shoe, internal expanding, self energizing type with lining 2½ in. wide in the front wheels and 4 in. wide in the rear wheels. The hand brake operates on the drive shaft and is mounted on the rear of the transmission case. The frame has several cross-members and is of deep cross-section at the points of greatest stress.

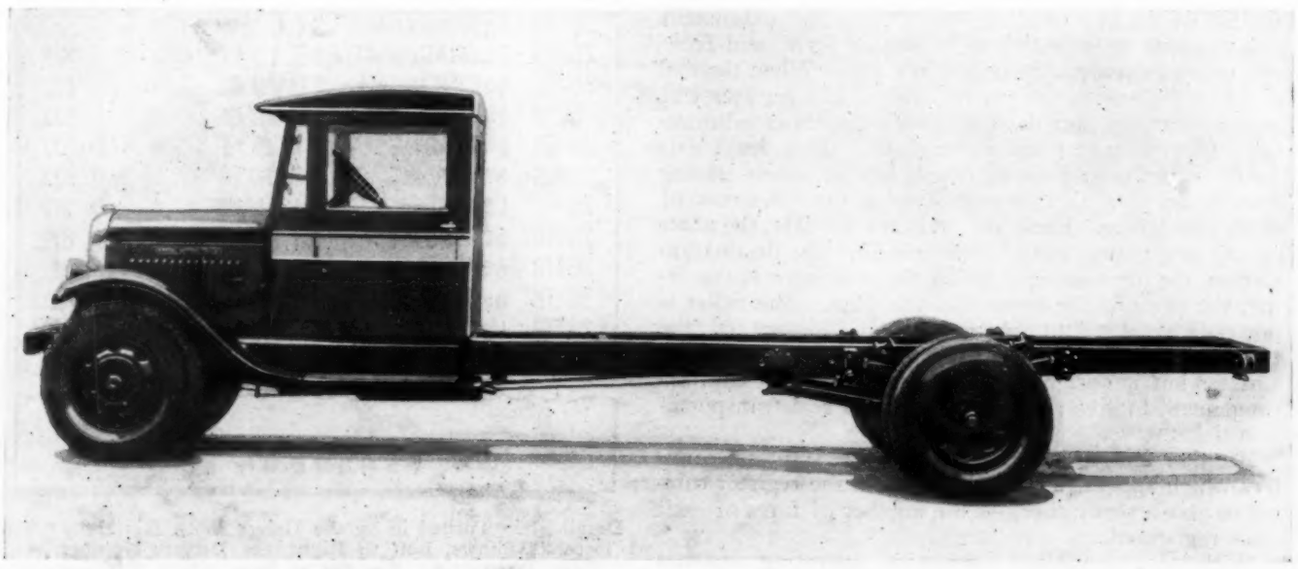
The Buick six cylinder, valve-in-head type engine is used, which has a bore of 3⅝ in. and a stroke of 5 in., giving 309.6 cu. in. piston displacement. This engine develops 89 horsepower at 2,500 r.p.m., the governed speed for pneumatic-tire trucks. The crankcase and cylinder block are cast in one piece, and the cylinder head, including the valves and rockers, is detachable. The crankshaft is statically and dynamically balanced, counterweighted and equipped with a torsional balancer. It is supported by four main bearings, each 2½ in. in diameter. The drop-forged carbon steel connecting rods have the piston pins clamped in the upper end. The lubrication system is of the force feed type to main and connecting rod bearings and to the valve rocker shaft. All oil is by-passed through and A C oil filter. The cooling system includes a centrifugal pump and a six-blade fan, which is driven by a V belt and is mounted on roller bearings. An oil-wetted air cleaner and a velocity type governor are regular equipment.

The clutch is a double disc, dry plate type with a ball thrust release bearing. The transmission has four speeds ahead and one reverse with ratios in first speed of 6.18 to 1; second speed, 3.81 to 1; third speed, 1.78 to 1; fourth speed direct, and reverse 6.51 to 1. Propeller shafts are 3 in. in diameter, tubular, and in one or two sections depending on the wheelbase of the truck. The steering gear is the worm and split-nut, semi-reversible type. Radius rods of heavy I-beam cross-section, having hardened pins and removable bronze bushings, relieve the springs of all horizontal driving stresses.

The king pins in the front axle are carried on tapered roller thrust bearings for easy steering, and self-adjusting ball-type tie rods are used. Spokesteel disc wheels, which are demountable at the hub and have integral



Full Floating Worm Drive Rear Axle

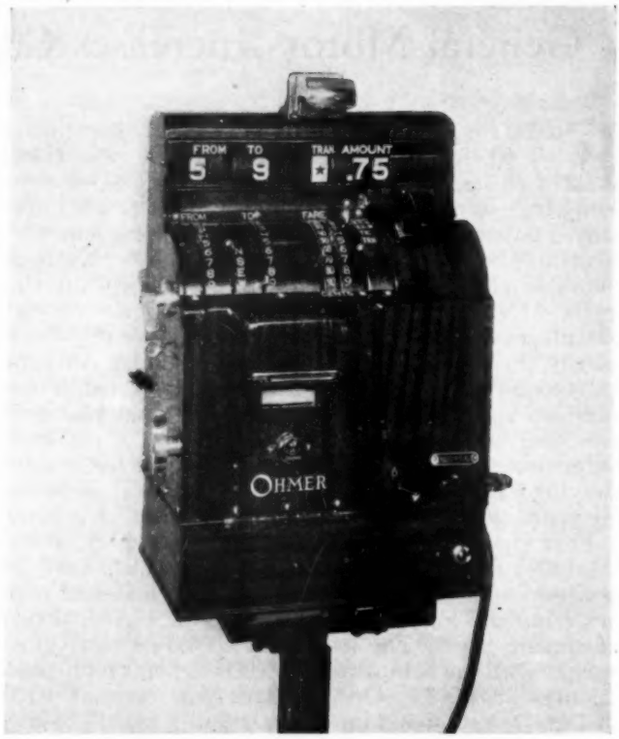


Model T-60 Special General Motors Truck

rims, are furnished, with a spare available at extra cost. A 25 gal. fuel tank is located under the driver's seat. Standard equipment includes 6 volt, 111 amp. hr. battery and pressed steel floor boards.

Ohmer Register Records Transportation Sales

THE Ohmer Fare Register Company, Dayton, Ohio, has widened the field of application of its ticket-printing register through the addition of a number of new features which contribute to its usefulness and enhance its value as a fare-recording device. The new model 80, shown in the illustration, has a large indicator showing the number of the originating station, the number of the destination station, the amount of the fare and the class of service. The figures of this indicator are large and stand out boldly so they can be seen the full length of the coach. An auxiliary indicator, to be placed in the bulkhead of the coach, can be obtained, which operates automatically in conjunction with the register by the pressing of the operating button for the registration of a fare. When this indicator is used, an inspector can observe from any part of the coach the number of passengers to whom tickets are issued and



No. 80 Ohmer Ticket Printing Register

One of the Tickets Indicated on the Detail Strip

thus make a positive check of the inbound and outbound traffic. This overhead indicator is said to be a feature exclusive to Ohmer fare registers.

The perforating attachment is another interesting feature of the improved register. With this attachment it is possible to issue tickets in coupon form, and from one to ten tickets can be issued in strips. When the dial is set to the number of tickets desired, the register will automatically cut off the ticket with the indicated number of perforated coupons attached. This feature is useful when selling round trip tickets or when issuing interline tickets to carry passengers over systems of other companies. Each coupon bears the date, the name of the originating station, the name of the destination station, the division over which the passenger is traveling, the price of the ticket and the class. The ticket is not only arranged to give a complete history of the transaction in a well-balanced and clearly explained manner but is designed, both as to shape, size and arrangement, to give the appearance of a real transportation ticket.

Another feature is the series of visual sub-total counters which appear through openings in the register cabinet to give a ready check of the number of fares of each class registered.

With transportation companies operating coaches over several divisions where there must necessarily be a repetition of station numbers, it would be difficult if not impossible to determine the actual revenue derived from each division without some means of identifying the division to which the register record applies. This identification is accomplished by means of printing division letters on the detail strip; namely, A-B-D-E-H-K-L-M-N-R, to be used as symbols for representing the divisions over which tickets are sold.

A further advantageous feature of this machine, and one which is necessary for the proper protection of the user, is the printing of the consecutive number on the ticket and on the detail strip within the machine. This

$54781.54
OPENING TOTAL
26 FEB 6 FRANKLIN $1.00 TR 0 8 4 4 822
26 FEB 6 SHARONVILLE $3.45 FF 0 8 4 3 822
26 FEB 6 CINCINNATI $0.90 CL 0 8 4 2 822
26 EEB 6 CINCINNATI $0.90 CL 0 8 4 1 822
26 FEB 6 READING RD. $1.55 FF 0 8 4 0 822
26 FEB 6 READING RD. $0.80 HF 0 8 3 9 822
26 FEB 6 READING $1.00 HF 0 8 3 8 822
26 FEB 6 PISGAH $1.77 SP 0 8 3 7 822
26 FEB 6 MASON $1.25 FF 0 8 3 6 822
26 FEB 6 SHARONVILLE $2.60 CL 0 8 3 5 822
26 FEB 6 COUNTY LINE $4.25 XC 0 8 3 4 822
26 FEB 6 CENTERVILLE $0.47 XP 0 8 3 3 822
CLOSING TOTAL
$54808.04

Detail Strip Turned in by the Driver With His Daily Cash Receipts Shows, Left to Right, the Drivers Number, the Date, Destination, Amount of Fare, Class, Transaction Number and Register Number.

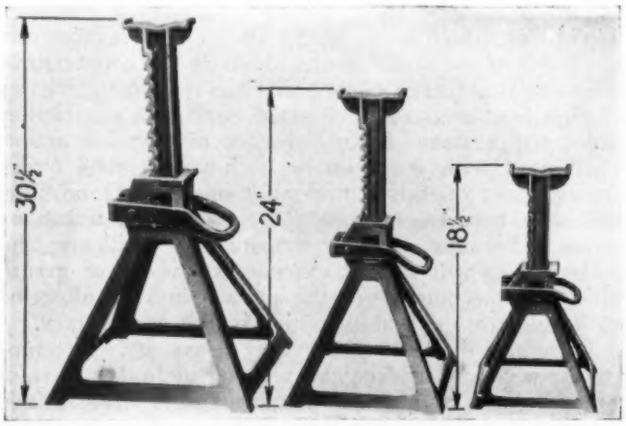
makes it possible to identify each ticket with the corresponding sale on the record sheet, and makes the auditing and checking definite and positive through the identification of each individual transaction. The consecutive numbers in the Ohmer register are composed of four figures, making it possible to register 9,999 times before the consecutive number wheel returns to zero. The detail strip carries the operator's number, and this identification of the operator with the consecutive number ties up the ticket with the detail strip and with the operator who made the sale, in such manner as to make the audit of sales simple and accurate.

The totals of the amounts of all fares are mechanically computed and printed on the record at such intervals as may be desired. These totals are printed in red ink and are separated from the printing of the collections, which thereby simplifies the auditing and gives no chance of confusing the total with the other printed items on the record. If the driver should wish to know the total amount of cash he is to turn in to the office, the mechanism of the machine is arranged whereby the opening and closing totals, by the insertion of the ticket through a slot, may be printed on the back of the opening ticket.

The electric motor located within the register makes possible fast and efficient operation. All that is necessary to issue tickets from the machine is to press the button, and when repeat tickets are required for several passengers going in the same direction, the button need be pressed once only for each passenger, and no resetting of the levers is required.

Heavy-Duty Shop Trestles

THE Manley Manufacturing Company, Bridgeport, Conn., has developed a set of trestles which provide a convenient, safe and quick method of supporting a truck or coach chassis when making repairs. These trestles are used to support the chassis rigidly after it has been jacked up, providing additional safety features of wide floor support and the impossibility of



Three Sizes of Safety Trestles

accidental release. The adjustment handle is forced down by the load, locking the ratchet teeth, and cannot be raised until all of the load has been removed.

The trestles can be used to support the chassis by the frame or springs, and are particularly useful in repair shops which do not have pits. Three sizes are available, having minimum lifts of 12 in., 16 in., and 19 in. and maximum lifts of 18½ in., 24 in., and 30½ in. respectively. The smallest has a capacity of 2 tons, and the largest 7 tons. The use of these trestles allows garage jacks to be used for other purposes.

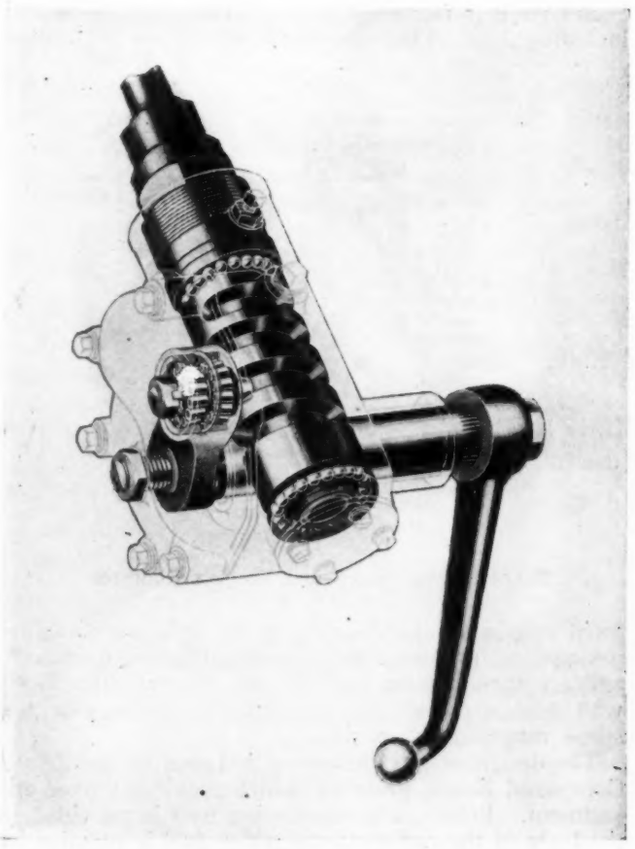
Ross Roller-Mounted Cam and Lever Steering Gear

THE Ross Gear and Tool Company, Lafayette, Ind., has developed and added to its present steering gear line an improved type of the cam and lever gear, which will be known as the Ross roller-mounted type. This new type produces steering effects which are approximately 50 per cent easier than have been obtainable previously.

The tapered stud which has heretofore been forged integrally with the inner arm is now roller-mounted so that it is free to rotate. This gives the stud rolling-contact with the cam-groove in the new type of gear, instead of sliding contact, as in other types.

This new rolling contact is the basis of the much greater steering ease produced. The rolling contact also minimizes the wear between the tapered stud and the cam, so that the need for servicing is much less frequent than with the gears as previously constructed.

The rolling movement of the stud is permitted by mounting it in two especially constructed Timken tapered roller-bearings of Chrome-Molybdenum Steel. This not only permits the stud and pin to rotate easily, but also provides the greatest possible contact surface. The rolling is established without any sliding action whatever, so that the wear is very slight. In actual



Sectional View Showing Taper Roller Bearings

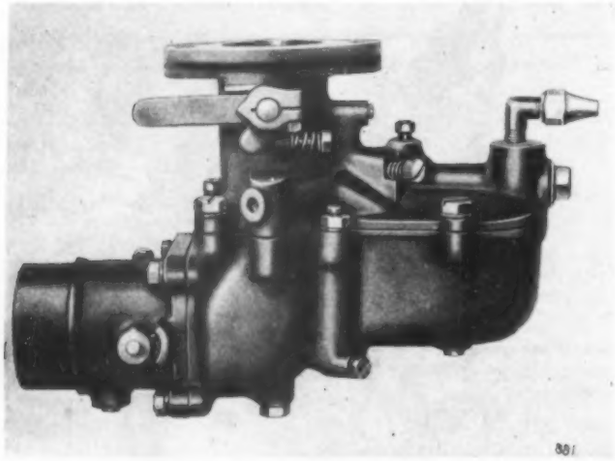
production the Timken roller bearing assembly is set up tightly and is then spun with electric motors in order to produce the initial "ironing in" of the bearing. Afterward the assembly is carefully inspected to see, first, that it rolls with sufficient ease, and, second, that it has no lost motion. Because of this precaution, the bearing assembly will go through a long period of operation in a steering gear without the necessity for any setting-up adjustment.

In the new "roller-mounted" type, a screw is provided in the sideplate. This screw bears on the end of the cross-shaft so that it may be adjusted endwise, both quickly and accurately. The adjustment does not adversely affect the alinement of any parts, but simply produces a proper relationship between the tapered roller and the cam. This careful provision for quick, easy adjustment, without adversely affecting alinement, is most important, since a gear constructed in this manner will continue to perform without loss of efficiency even though it has had many hundreds of thousands of miles of operation, and has been adjusted several times.

In practical driving tests, it is claimed the new roller-mounted type of steering gear has a solid, safe feeling which gives drivers the assurance that they have full control of the vehicle at all speeds.

Zenith Series 90 Carburetor

A LINE of heavy-duty carburetors for motor coach and truck service, especially designed to be shock-proof and exceptionally durable under the most severe operating conditions, has been developed by the Zenith-Detroit Corp., Detroit, Mich. Known as the Series 90, it is furnished in sizes from 1 in. up to and including 2 in. The few wearing parts are accurately



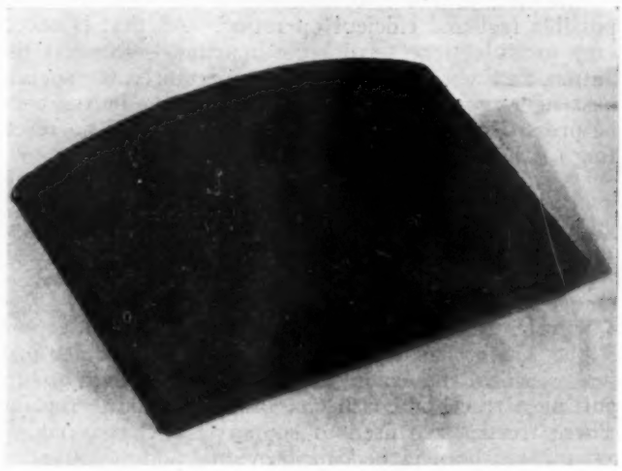
Zenith Motor Coach and Truck Carburetor

fitted and have large bearing areas. The air and fuel passages are proportioned to provide maximum capacity and accurate metering, so that full power is developed with economy and smooth operation throughout the speed range of the engine.

The design of this carburetor is based on the Zenith Compound Nozzle principle, which provides a fixed adjustment. Briefly, a compensating well is provided in the body of the carburetor to which fuel is supplied by a special jet, directly from the float chamber. If the engine is idling this well remains filled with fuel; but when the throttle is opened there is a rush of air to fill the vacuum above the throttle, and the reserve of fuel in the compensator is quickly drawn into the air stream, resulting in fast acceleration and immediate power availability. By the time the compensating well is drained of its supply, the inertia of the fuel in the main jet has been overcome, which then supplies all the fuel directly.

J-M Brings Out Metallic Asbestos Brake Block

THE Johns-Manville Corporation, New York, following extensive research work on the moulded block type of brake lining for motor coaches and trucks is now prepared to supply this lining for new or replacement service on those vehicles which are designed for its use. The J-M metallic asbestos brake block consists essentially of a thick block of asbestos, with a suit-



Moulded Brake Block

able binder, which is moulded to the exact circumference and width of the brake shoe, and has deeply countersunk holes for attachment. The lining has the characteristics of high heat resistance, constant coefficient of friction under temperature change, absence of abrasive action when used with gun iron or high-carbon steel brake drums, quiet operation under all operating conditions and safe performance in the presence of water or grease. Because of their density and resilience, the brake blocks will rapidly extrude any water or grease which may accumulate on the surface, and the effect of such fluids on the braking action is only momentary.

To reduce the "out of service" delays and to eliminate the necessity of frequent relining of brakes, certain motor coach and truck manufacturers have made changes in the design of their brake mechanisms to accommodate thicker linings.

The J-M brake block is particularly adaptable to this design as it can be moulded to any desired thickness; and it is claimed, unusually high mileages without relining have resulted from its use. It has been found that the uniform deceleration and the elimination of grabbing or locking in braking has substantially increased tire mileage. The blocks are fastened to the brake shoes in the conventional manner.

Every-Day Problems

of Motor Coach and Truck Operation

This Month's New Questions

Question No. 14

Keeping Motor Coaches Clean

"What is the best practice with respect to the cleaning of motor coaches? What washing system is used, and what liquids are employed for cleaning different parts? How often are the coach exteriors cleaned? How often the chassis parts? How are the interiors cleaned, and how often? What washing equipment is provided, and how many coaches can one man take care of?"

Question No. 15

Disposing of Worn-Out Equipment

"When motor coaches have been worn out or have had to be retired from service for other reasons, what is done with them? To what extent is an attempt made to modernize old equipment? Is this worth while? If old equipment is junked, is an effort made to salvage any parts? Are these worth the expense of reclamation? What is your experience as to the actual life of the average motor coach in terms of miles?"

What Is Your Answer?

Replies to Question No. 8

Selecting and Training Drivers

"In hiring drivers, what qualifications should be considered essential? What examinations should be given and what experience is desirable? What is the most effective way of training drivers to perform their duties efficiently and to observe the rules of safe driving? Should a merit and demerit system be used, hooking it up with a bonus system? If so, what system and amount of extra pay have been found most successful?"

The New England Plan

As the outcome of our experience, the minimum age for prospective drivers has been set at 25 years, and the maximum age at 35 years. We look for men not under 5 ft. 6 in. in height, and weighing not less than 150 lbs. They must have at least a grammar school education, and past experience in driving heavy vehicles. Also applicants must be able to furnish satisfactory references from previous employers, and these references must satisfy the requirement of the bond-

ing company, as all of our motor coach operators are carried under a schedule bond.

We attempt to select men of good appearance, and look them over carefully to determine if they have the stamina that is necessary, and the personality that will enable them to come into contact with the public in a manner that will leave a favorable impression. Transportation requires men of courage and endurance, and men must be trained to be entrusted with the responsibilities of handling safely those who entrust themselves to our care. Appearance and general deportment must be closely checked after such applicant enters into a probationary period of tryout in actual service.

Preliminary to employment, applicants are required to pass the visual, color perception and hearing examination which is conducted, in our case, by the same examiner who conducts such examinations covering applicants entering the service of the New Haven. The applicant is then required to undergo a physical examination, conducted by a physician appointed by our company, who is usually the same one employed by the New Haven. Also the applicant is required to demonstrate his ability as a driver, first under the supervision of a representative of the mechanical department, who passes upon his competency in so far as the manual operation of the coach is concerned. Passing this test, he is taken in charge by an officer of the operating department, and required to demonstrate his driving ability in city traffic.

My experience has indicated that if a man is a driver and meets the indicated requirements and has not had previous experience with any large organization, he usually responds more readily to special instruction in our methods of operation than does the man who has been trained and seasoned as a driver and who has acquired habits and practices out of conformity with those employed by our company. Illustrative of this, drivers who have had long experience as taxi drivers have developed certain habits and practices that do not conform with safe practices necessary in the operation of heavy vehicles, and as the outcome of our experience we are reluctant at this time to consider a man fresh from the taxi service. Our past experience has indicated that a man so trained, in most instances, becomes very troublesome when he undertakes to maneuver a motor coach in the same manner as he would a taxi.

We have been satisfied with drivers who have handled heavy trucks and who therefore have the trained judgment that follows such experience. They more readily respond to our special instructions and in their knowledge of our operating rules. After they have had a reasonable length of service, we find that they have absorbed in substance most of our instructions, and they constitute the group of our drivers who measure up more nearly to our requirements than do the men who come to us with no more than a small-car driver's experience.

After the foregoing examinations have been passed, the applicant is then directed to ride certain routes for the purpose of learning their physical characteristics, and at the same time to acquaint himself with the various duties which he must know in order to satisfy the requirements of the accounting department. When he is ready to be examined on these features, he is required to pass satisfactorily an oral examination before the representative of the superintendent to whom is delegated the responsibility of qualification of drivers. Subsequently he is assigned to extra work, and is eligible to be called to work in the territory in which he is qualified. He may subsequently extend his knowledge of the physical characteristics of other routes until he has become fully qualified to work on any line in the operating territory under the supervision of his division superintendent.

The driver is given and held responsible for a copy of the operating department rules, and he is required to familiarize himself with these rules. He is later subjected to a special oral examination and is also orally instructed on safe operation by the officer conducting the examination. Supervisors have special instructions to give particular attention to the new man and to keep in touch with the progress which he makes, and in this way the superintendent is closely informed regarding the ability and conduct of every man new in the service.

This period of training and instruction is never over. Group meetings with the operators are held at the major terminals, and these meetings are usually presided over by the superintendent. At this time, open discussion is permitted on matters incidental to operation. Men are not only examined once, but are regularly re-examined on the operating rules, the object being not only to refresh the minds of the men but to finally inculcate into their minds the fundamental rules of safe operation of a motor vehicle. Special instructions are handled through the medium of circulars and bulletins. Bulletin boards are provided for this purpose at all garages and terminals, and operators are required to note each day before going to work the matter contained thereon, and they are held responsible for properly following out all directions set forth therein.

The matter contained on these boards is connected each month, and a bulletin is prepared on the first of each month which contains the instructions which are still in effect. Then through the month, this bulletin is supplemented with other instructions. All obsolete matter is removed on the first of each month. The bulletins deal with matters concerning timetable schedules and route characteristics. Circulars deal with other matters incidental to the conduct of the business of the company. The accounting department and also the traffic departments, freight and passenger, have their bulletin boards, and we have recently augmented this and are now in process of following out the use of a safety bulletin board, which each month will carry a safety bulletin setting forth in a summary the accidents, their causes and suggestions as to how they could have been avoided.

Our experience indicates that the proper training of men can only be accomplished through sufficient and competent supervision. In our operation, this supervision on the road is exercised by the operating department, and between the accounting and operating department representatives, a co-ordination of effort is in effect. While each department acts independently, its representatives, as stated above, co-ordinate their efforts to the end that, in the course of training of new drivers, they are corrected in their mistakes and encouraged to submit any questions relative to their duties to either department.

Consideration has been given by our company to the merit and demerit feature, but thus far, due to the fact that we have young and as yet inexperienced men, it has not been felt that they would understand and appreciate the meaning of demerits or the reward of merit. In the matter of merit, if we receive any commendatory letters, they are recorded in the operator's personal record file; and if he performs any meritorious act

which reaches the attention of the superintendent, he is commended. Disciplinary matters are dealt with by letters of record indicating a caution or reprimand, and beyond this by actual suspension, as this method of discipline seems to be the only one that is as yet understood, and to which we feel the operators properly respond. The bonus system has been discussed between the company and the employees, but they have chosen to accept their reward in the way of wages and working conditions as agreed upon with the management, rather than to set aside any sum to be applied as a bonus or reward for efficient and satisfactory work.

The company deals with its employees in the open, and all men are entitled to the right of appeal to the highest officer. In this respect, their affairs are conducted much in line with the practices of the older means of transportation, rail and trolley.

In recognition of good service, the company awards stars, bronze, silver and gold; these insignia indicate operation without accidents. A bronze star is given to a driver to mark a period of six months without any accident for which he is responsible; similarly a silver star is given for one year of operation without accident, a gold star for two years and a gold star with a diamond set in it for five years. This practice has been in effect now for over a year, and we note that the men are interested and feel very much grieved when forced to surrender the right to wear the insignia.

H. M. WALKER,
General Superintendent, New England Transportation Company.

Replies to Question No. 10

Developing Special Party Business

"In attempting to develop special party business for chartered motor coach service, is it better to depend upon solicitation by regular traffic agents of the motor coach company or the railroad owning it, or to employ a special solicitor to handle this work? What are the best sources of traffic of this kind? Is advertising worth while, and if so, in what kind of publications? Are any particular types most in demand? What rates are generally charged for this service?"

Rates on Union Pacific Stages

In our organization, most of the charter car business is developed by the traffic department of the stage company, although all employees are on the look-out for this class of business, which we consider very desirable. Some of this business comes to us through the railway system (O.-W.R.R. & N.) where combination rail and stage trips are planned for special parties.

This traffic comes mostly from lodges, churches and athletic teams of high schools and universities. No specific advertising is used to attract this class of service. Whenever it is possible to do so, the most modern and up-to-date equipment we own is used for special car service, as the best advertising is secured through the medium of a well pleased party.

Our tariff for chartered cars is rather complicated, being based on the mileage operated, but varying with the number of passengers to be carried and the type of road to be covered. A few representative rates are shown in the following tabulation:

No. Passengers	One Way Movement Paved Road	One Way Movement Macadam Road	Round Trip Movement Paved Road	Round Trip Movement Macadam Road
20	$.55	$.80	$.35	$.45
25	.65	.95	.44	.57
30	.75	1.10	.53	.68
35	.85	1.25	.62	.79
40	.95	1.40	.70	.90

H. R. LEIGH,
General Superintendent, Union Pacific Stages, Inc.

Advertising Worth While

In attempting to develop special car movements, we depend upon solicitation by the regular traffic men. The best sources of traffic for this business have been clubs, fraternal organizations and conventions. We have found advertising very much worth while.

There has been no demand for any particular type of equipment. The rates charged by our company have been from forty to fifty cents per mile, based on the kind of trip desired and the road over which car was used. The average number of passengers carried by us on these trips has been 25.

H. A. WOOSTER,
General Traffic Manager, Pickwick Stages System.

Replies to Question No. 12

Purchase and Storage of Gasoline

"What are the respective advantages of the purchase and storage of gasoline in large or small quantities? Does the saving in the cost of gasoline purchased in large lots more than off-set the losses encountered in handling such quantities? What prices are now being paid for gasoline purchased in various quantities? Is gasoline ordered on specification, or by ordinary brands?"

Does Not Buy by Carload

Practically all of our gasoline is handled in 550 gallon tanks located in our own shops. At the present time, we do not believe that the slight saving by purchasing in carload lots will compensate for troubles in accounting, handling and evaporation and other losses incident thereto.

The average price of our gasoline is about 18 cents per gallon. At the present time we are purchasing by brand rather than by specification.

WARREN A. TAUSSIG,
General Superintendent, Southwestern Transportation Company.

Replies to Question No. 13

How Much Work from Coach Drivers?

"What mileage per day are the railway motor coach operating companies obtaining from their drivers? What is considered a good average daily mileage for drivers, and what is the general opinion as to the max-

imum number of miles which a driver can make in one day without loss of efficiency? Are drivers paid by the day or by the mile?"

Drivers Average 210 Miles Daily

It is our view that 200 to 250 miles per day is a good average mileage for coach operators. Operators of the Missouri Pacific Transportation Company are making an average of about 210 miles per day. We do not believe an operator can make more than 250 miles per day without loss of efficiency, and if he makes that amount of mileage he should be relieved at least one day in seven. Our operators are paid by the mile, with few exceptions.

P. J. NEFF,
Vice-President and General Manager, Missouri Pacific Transportation Company.

Practice of Oregon Stages

At the present time, our drivers are averaging about 185 miles per day. However, we are operating the winter minimum service, and this accounts for the low figure. We consider a daily average of 200 miles a good figure to strive for in mapping out runs. Using 25 miles per hour as an approximate basis for speed of schedules, this gives a driver about eight hours actual driving, and that coupled with layover time of one or two hours, makes an average day of, say, ten hours.

The actual conditions of the various runs will, of course, vary. In our widespread operations, we have to cope with almost every possible physical condition. and considering this, in combination with the trend of traffic in different localities, the distribution of a driver's time takes many forms. Then, too, the Public Service Commission has ruled that the actual driving time shall not exceed 8 consecutive hours, nor 10 hours within 24. This is a very practical ruling and works out to the complete satisfaction of both operator and driver.

For example, our main line extends south from Portland along the Pacific Highway to Medford, a distance of 317 miles. Eugene, 130 miles from Portland, is the division point where drivers are changed. The running time from Portland to Eugene is five hours, and a day's work for this first driver consists of a round trip between these two points, with a layover of one or two hours in Eugene, thus making 260 miles with ten hours actual driving, excepting two rest stops, within a spread of eleven or twelve hours. On the lower leg of the schedule through the mountainous country from Eugene, to Medford, 187 miles, the running time is seven hours and thirty minutes of continuous driving, excepting four rest stops, and on some schedules a meal stop. Upon arrival at Medford, this driver's day is over, and after a layover of some ten or twelve hours, he makes his return trip to Eugene where there is another long layover. These schedules, with a few exceptions, make up our portion of the interstate operations carried on by the consolidated companies, and compose the longest of our runs. Such runs are comparatively simple in construction; the difficulties lie in the local main and branch line schedules.

Here we are faced with the problem of providing adequate, economical service, and at the same time, since we pay on the mileage basis, produce enough mileage to secure a maximum of work from the driver as well as to make the run sufficiently attractive to keep the driver satisfied. As an example of this type of run, we have our service between Salem and Silverton—part of an inheritance from a small operation purchased. The route lies through a very sparsely settled countryside, a distance of 15 miles, and the schedules are operated principally to handle a star route mail contract. Here we have three round trips per day, a total of 90 miles, with a running time of 45 minutes per schedule and a spread of 10 hours and 45 minutes for the driver. Thus we have the two extremes, but from the average maintained it will be seen that the preponderance of runs is well up to the maximum.

Also, in addition to the interurban operations, there is the city service in Salem and Eugene. These runs average between eight and nine hours, and are split into "day" and "night" runs. To cite one example: A "day" man starts out at 6:15 a.m., and runs until 11:15 a.m., when he is relieved by a "night" man for two hours. He returns at 1:15 p.m. and runs until 5:15 p.m., at which time the "night" man returns and completes the run at 11:30 p.m. The city drivers average 170 miles per day.

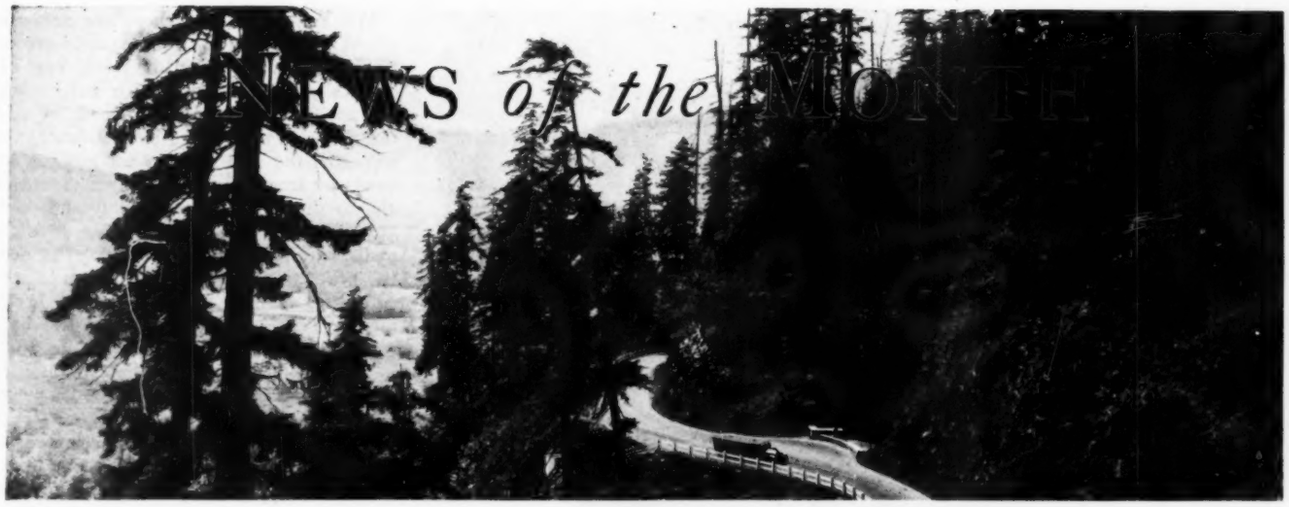
In our opinion, a driver begins to lose his efficiency after 250 miles of driving. For this reason, those men who handle the Eugene "turn-arounds" mentioned above, are compelled to take two days off each week. All other drivers, excepting those assigned to city runs, are compelled to take one day off each week. There is, however, no option as to which day or days these shall be. They are figured into each run, and on such days the schedules are pulled by assigned relief men.

As stated above, the interurban drivers are paid by the mile, using 3½ cents per mile as a basis, with a minimum rate of $5.00 per day. In some cases, where a run requires that a driver alternate in his tie-up point, we have added to the mileage figure an arbitrary amount to take care of a room at the point opposite his "home" terminal. In city service, a rate of 53 cents per hour is paid, and straight time for any extra work required.

R. W. LEMEN,
President and General Manager, Oregon Stages, Inc.

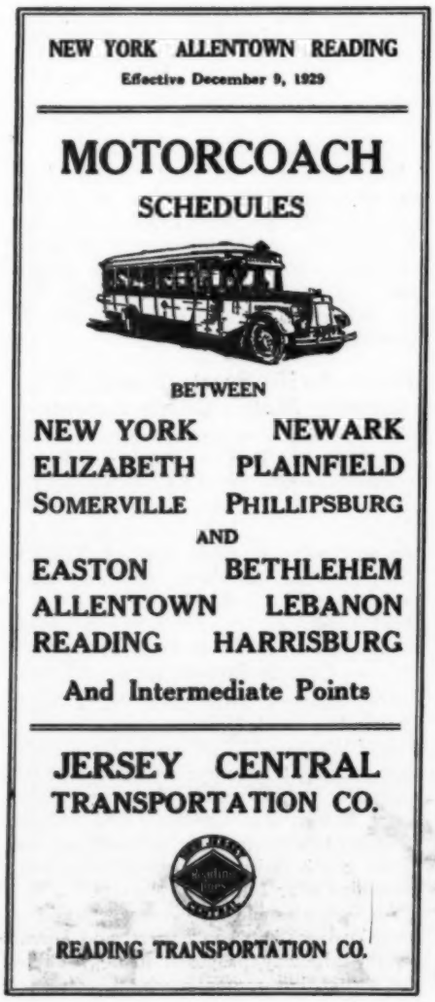
* * *

White Motor Coach Operated by Cotton Belt



Reading and Jersey Central Subsidiaries Unite on New York-Harrisburg, Pa., Route

Five motor coaches placed in service on December 9—Schedules call for two daily round trips and list 70 intermediate stopping points



The Reading Transportation Company and the Jersey Central Transportation, highway subsidiaries respectively of the Reading and the Central of New Jersey, have joined in the inauguration of motor coach service between New York and Harrisburg, Pa. Operations commenced on December 9, when five motor coaches were installed on the run; two daily round trips are being made.

The poster announcing the inauguration of the service states that "Express motor coach service will be established between New York, Elizabeth, Plainfield Somerville and Phillipsburg, N. J., and Easton, Bethlehem, Allentown, Reading, Lebanon and Harrisburg, Pa., and intermediate points."

The five motor coaches now in use are owned by the Reading Transportation Company, which supervises the operations on that section of the route between Allentown and Harrisburg. Operations between New York and Allentown are directed by the Jersey Central Transportation Company.

The through one-way fares between New York and other points are as follows: Easton, $1.90; Bethlehem, $2.15; Allentown, $2.25; Reading, $3.15; Lebanon, $3.85 and Harrisburg, $4.45. Fares from Newark, Elizabeth, Plainfield, Somerville and Phillipsburg to the foregoing points vary in regular degression while proportionate fares are in effect to intermediate points.

The coaches leaving New York depart

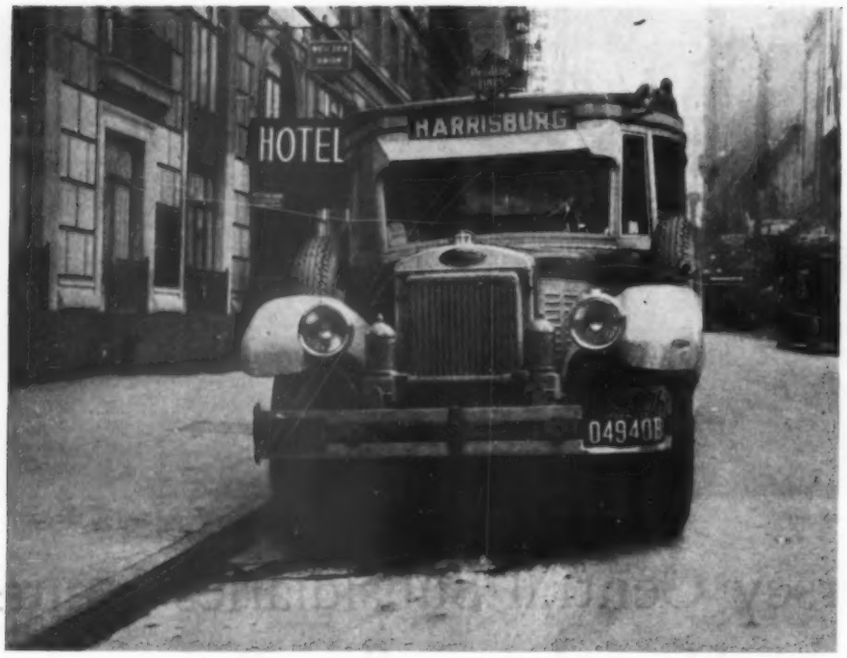
Sees Railways as Logical Highway Operators

"Motor coach transportation must inevitably come under the control of the railroads and be co-ordinated with steam and electric service," said Agnew T. Dice, president of the Reading, in a recent address before the Manufacturers Club of Philadelphia. "I believe that the public wants the men who have experience in transportation matters to control the future of highway motor coach development," continued Mr. Dice.

The speaker next pointed out how the Reading has entered the motor coach field and by substituting these highway vehicles for unprofitable trains has effected annual savings over steam operation of $270,000.

The Reading Transportation Company, highway subsidiary of the Reading, Mr. Dice said, is now operating 271 motor coach schedules over 563 route miles. The annual mileage operated by these Reading motor coaches is 2,500,000.

"It is apparent that the public demands this form of transportation," Mr. Dice said as he concluded with the followinng comment on the need for regulation of interstate motor coach lines: "It is still an experiment and until Congress enacts laws effecting interstate operation, safety and dependability of service cannot be assured."



Reading-Jersey Central Motor Coach Leaving New York for Harrisburg, Pa.

from the Central Union Bus Terminal, which is located on West Forty-third street, between Seventh and Eighth avenues. In Newark the designated stop is made at the Broad Street station of the Central Railroad of New Jersey. According to the present schedules, motor coaches leave New York at 9:00 a.m. and 1:00 p.m. They are due in Harrisburg respectively at 5:40 p.m. and 9:40 p.m., each making the through run in eight and one-half hours. In the opposite direction, motor coaches leave Harrisburg at 8:50 a.m. and 2:00 p.m., arriving in New York respectively at 5:20 p.m. and 10:30 p.m. The 9:00 a.m. coach out of New York arrives in Allentown at 1:35 p.m. where it remains until 2:00 p.m., thus affording time for passengers to procure lunch. Likewise the 1:00 p.m. coach out of New York makes a 25-minute meal stop at Allentown. Coaches in the opposite direction each make 15-minute meal stops at the same point.

On some sections of the route, the operations are restricted. Thus no tickets may be sold locally in the state of New Jersey nor in the state of Pennsylvania between Easton to Bethlehem, inclusive, and any other point in the state. Children under five years of age when accompanied are transported free; children between the ages of five and twelve are charged half fare. Hand baggage limited to 60 pounds per passenger is carried free while no trunks are accepted for transportation.

Merger of New Jersey Lines

The Public Service Interstate Transportation Company, subsidiary of the Public Service Corporation of New Jersey, will, on January 1, take over 18 additional motor coach lines operated by 21 companies now controlled by the O. G. Schultz interests in New Jersey and Pennsylvania. It is planned to merge these companies with the Public Service organization as soon after the acquisition as possible. Motor coach lines between New York and Philadelphia and New York and Atlantic City are among those involved. These and other routes controlled by Schultz operate 264 motor coaches and employ approximately 500 men.

In announcing the acquisition M. R. Boylan, vice-president in charge of operation of the Public Service Interstate Transportation Company, said, "We feel that this action means a step forward in solving the South Jersey Transit problem. It means an extension of the unified control that everyone familiar with the situation believes to be essential to the provision of adequate service. It will permit further co-ordination, will avoid duplication of effort and will give opportunity for better direction of transit facilities.

"We intend to put into effect with the companies we take over the wage scales now paid on Public Service lines, which are higher than those now paid and we will extend our training and personnel system to this new operation."

Urges Truck Regulation in New York

The regulation of rates and practices of motor truck lines which act as common carriers was suggested to a special legislative committee of the New York State Legislature which is investigating proposals to revise the Public Service Commission law of that state. This truck-regulating proposal, according to reports published in the New York Journal of Commerce, was made by Theodore D. Pratt, general manager of the Motor Truck Association of America, at a hearing before the committee on December 18.

Mr. Pratt held that there are only two points on which the shipper needs protection from the actions of truck line operators. Where liability for safe transportation of freight is concerned, he said, the shipper is protected by insurance, and secondly, the rate he pays for sending his goods by truck is governed by competition and by the fact that he can buy and operate his own trucks if necessary. It is the owners of the trucking systems who need the protection, Mr. Pratt held, since it is illegal for them to fix their rates by agreement. Truck owners would like to have minimum rates fixed by the Public Service Commission, feeling that competition will take care of any charges over such rates, he continued.

Mr. Pratt further favored a separation of his proposed regulatory legislation for trucks from the general law of the Public Service Commission, holding that there can be no comparison between freight and passenger highway carriers. In this latter connection he pointed out the great variety of freight carried and the different methods of lines carrying it, thereby emphasizing what he regarded to be the necessity of keeping motor coach and motor truck regulatory legislation entirely separate.

Burlington Proposes New Line

The Burlington Transportation Company, motor coach operating subsidiary of the Chicago, Burlington & Quincy, has applied to the Iowa Railroad Commission for a certificate to operate motor coaches over U. S. highway No. 34 between Villisca, Ia., and Chariton.

Cancels Railway's Permit

The Arkansas Railroad Commission, on December 10, cancelled a permit granted to the Thornton & Alexandria for the operation of motor coaches between Fordyce, Ark., and Camden. The permit was revoked on account of the failure of the railway to operate motor coaches as permitted by the certificate.

Union Pacific Starts Kansas City-Denver Motor Coach Service

Motor coach service between Kansas City, Mo., and Denver, Colo., was begun by the Interstate Transit Lines, subsidiary of the Union Pacific, on December 10. This line is doing both interstate and intrastate business, except between Topeka, Kan., and Salina, where only interstate business can be handled.

Milwaukee Proposes Motor Coach Substitution

The Chicago, Milwaukee, St. Paul & Pacific has applied to the Department of Public Works of Washington for permission to substitute motor coach service for passenger train service between Cedar Falls, Wash., and Everett. The railway proposes to operate at the present time one motor coach making one round trip daily between Cedar Falls and Everett.

An independent line is now handling local business between Everett and Duvall on the highway proposed to be used by the Milwaukee motor coach, the distance

between Everett and Duvall being about one-third of the total distance between Everett and Cedar Falls. The railway is requesting authority to handle all available traffic between Everett and Cedar Falls, in spite of the present operation over a portion of this territory by the independent company.

New York-Montreal Service Increased

The Gray Line Motor Tours of New York recently inaugurated additional service between New York and Montreal, on which run it is now operating a daily motor coach. The additional service contemplates a tri-weekly schedule in each direction with motor coaches leaving New York at 9 a. m. on Tuesday, Thursday and Saturday and the return trip leaving Montreal at 9 a. m. on Monday, Wednesday and Friday.

Rock Island Proposes First Motor Coach Line in Iowa

The Chicago, Rock Island & Pacific has applied to the Iowa Board of Railroad Commissioners for permission to operate motor coaches between Omaha, Neb., and Des Moines, Iowa, over U. S. highway No. 32. This line is only one unit of a network of motor coach lines throughout Iowa planned by the Rock Island, according to reports of a statement by C. C. Gardner, assistant general passenger agent. The line will be operated by a subsidiary of the Rock Island, the Rock Island Motor Transit Company.

Postpone Hearing on Proposed Mileage-Basis Truck Rates

The hearing on the petition of the Texas Motor Truck Carriers Association for the establishment of rates for the transportation of freight by motor truck on a mileage basis has been postponed until January 6. The delay in the hearing has been due to the fact that the applicants have not had sufficient time in which to prepare exhibits.

The mileage rates proposed by the motor truck carriers will probably be more than railroad rates, due to the fact that the truck carriers furnish store-door collection and delivery service on shipments handled by them.

Motor Truck Big Factor in Ohio Wheat Movement

The motor truck has become a big factor in the movement of wheat from the fields to the country elevators in Ohio, according to a recent survey made by Charles M. Fritz, grain exchange supervisor of the Chicago office of the Grain Futures Administration of the United States Department of Agriculture.

Mr. Fritz observed a growing tendency among Ohio farmers to sell their wheat f. o. b. the farm and to make purchases of fertilizer, lime and mixed feed on terms including delivery at the farm. In order to make such deliveries, Ohio elevators have equipped themselves with trucks for delivery purposes and with these trucks haul the wheat to the elevators.

Predict Early Passage of Interstate Regulation Bill

President Hoover's interest in promoting the efficiency of the nation's transportation systems has given operators of motor coach lines considerable hope that Congress will be prevailed upon to enact legislation for the regulation of interstate operations in order that they may proceed to better serve the public through contemplated extensions and improvements, says the National Association of Motor Bus Operators in a statement recently issued from its Washington, D. C., headquarters.

"Although the federal government exercises close supervision over railroads, radio and other agencies engaged in interstate operations," says the statement, "irresponsible motor coach operators have been allowed to enter interstate traffic without any sign of control.

"The seriousness of the situation can be seen from the fact that there are more than 90,000 motor coaches in operation, of which around 40,000 are engaged in common carrier service. They are used in conjunction with rail lines, for long-distance operations and have recently entered the field of night travel with sleeper accommodations.

"Without adequate legislation to regulate interstate motor coach operations, responsible owners engaged in this field of transportation are hesitant to proceed with desired extensions and improvements.

"They are confronted with the problem of providing adequate service and protecting passengers in a field that has been invaded by irresponsible operators, using antiquated equipment and offering no protection to patrons. This highly-specialized and important transportation system is in a chaotic condition that can only be remedied through federel intervention.

"Senator Couzens and Representative Parker have offered bills in their respective Houses of Congress to provide for the needed legislation. They are expected to ask for hearings as soon as the approaching regular session gets underway. Meantime, state officials are preparing to join with bus operators in urging Congress to act."

Urges Interest in Regulatory Legislation

The National Association of Motor Bus Operators, in a recent statement, urged all motor coach operators to take it upon themselves to impress upon their Congressional representatives the need, from both the operators' and the public's standpoint, of interstate motor coach regulation as provided in the pending Couzens and Parker bills. Operators living in districts represented by Congressmen on the House Interstate and Foreign Commerce Committee, the statement continues, should make a particular point of explaining to such members conditions in their respective territories and should also get their Chambers of Commerce to endorse their views on the immediate need for regulation.

Twin Coach in Service of Union Pacific Stages

Motor Coaches Replace Train on Georgia Railroad

Substitution of motor coaches for the "Picayune," local train between Augusta and Thomson, on the Georgia Railroad, was recently authorized by the Georgia Public Service Commission. It was claimed by the railroad at the hearing that the annual cost of operating the "Picayune" was $42,869, while the revenue derived from it amounted to only $10,229.

The petition was opposed by the citizens of Augusta and cities along the route but the Commission nevertheless permitted the substitution. Motor coaches will operate on the same schedules as did the "Picayune."

Big Expansion in Union Pacific Stages Operations

During the past year, the Union Pacific Stages, Inc., motor coach operating subsidiary of the Union Pacific System, has increased the number of its motor coaches in operation from 8 to 75. At the same time, it has increased its route mileage from 231 miles to 2,044, the routes over which motor coaches are now being operated daily extending from Portland, Ore., and Spokane, Wash., to Salt Lake City, Utah, and Yellowstone Park, by way of Boise, Idaho and Pocatello. There are also a number of branch lines radiating from these main lines. Motor coaches of the Union Pacific Stages are now operating in excess of 3,000,000 miles annually.

N. J. Permits of Pennsylvania General Transit Approved

The Pennsylvania General Transit Company, highway subsidiary of the Pennsylvania recently received from the Board of Public Utility Commissioners of New Jersey approval of municipal consents which had been obtained for the operation of motor coaches over two routes in that state.

One of the orders involved the transfer of consents from the White Bus Line to the Pennsylvania General Transit Company for the operation of three motor coaches between Toms River and Point Pleasant, N. J. The second order approved municipal consents which had been acquired by the railway subsidiary from Joseph P. Mahan for the operation of two motor coaches between Trenton and Seaside Park, N. J. This latter was granted on the petition of the Pennsylvania for a rehearing since the board, in an order dated July 12, had denied the application of Mahan for the same approval.

In connection with this latter approval the Pennsylvania agreed to accept certain restrictions and thus the Trenton Transit Company and the Public Service Co-ordinated Transport withdrew their objections to the application. The board in reversing its previous decision said "The changed conditions existing at the present time indicates to the Board that the operation of motor coaches between Trenton and Seaside Park, New Jersey, with certain restrictions, will not be in competition with the existing transportation facilities and for that reason will change its determination in its decision of July 12, 1928."

Pickwick to Spend $1,250,000 for Equipment

Plans of the Pickwick Stages System, with which the Southern Pacific Motor Transport Company is affiliated, to spend approximately $1,250,000 for 100 new motor coaches in 1930, were disclosed at a hearing before the California Railroad Commission on December 10, at which applications of several motor coach lines were made for certificates to operate over the new Roosevelt highway between San Diego, Cal., and San Francisco.

Trucks Taxed on Loads Actually Carried

Operators of motor trucks in Iowa must pay license fees based upon the actual weight of loads transported, if they haul loads of greater weight than the load capacity specified on their trucks. This regulation is part of the new law governing the operation of motor trucks, which was passed by the 1929 legislature and became effective on May 3. Subsequently a court at Sioux City, Iowa, issued an injunction restraining the collection of the extra fees, but the Supreme Court stayed the injunction and authorized the collection of the fees until it renders a final decision on the appeal.

According to R. H. Bloodgood, inspector for the state motor vehicle department, every truck operator must classify his trucks as to load actually carried during 1929. If loads were carried weighing in excess of the rated capacity of a truck at any time after May 3, the operator must pay an extra license fee for the period from May 3 to December 1, and must pay the new fee for 1930 on the same basis. The new law prohibits the operation of motor trucks on the public highways carrying loads exceeding in weight by more than 25 per cent the rated loading capacity of the truck.

Texas & Pacific Subsidiary Files Tariff

The Texas & Pacific Motor Transport Company, subsidiary of the Texas & Pacific, on December 9 filed with the Texas Railroad Commission, a tariff covering class rates on l.c.l. shipments from Dallas, Tex., and Fort Worth to points on the Texas & Pacific as far east as Marshall and as far west as Midland. The plan of operation of the Texas & Pacific Motor Transport Company is similar to that of the Pacific Electric Motor Transport Company, described in recent issues of the *Motor Transport Section.*

The motor transport company picks up merchandise at shippers' doors, trucks it to the railroad, which carries the freight to its destination, at which point trucks of the motor transport company again pick up the shipments and deliver them to the doors of consignees. The motor transport company is understood to contract with the railroad for the rail service, the motor transport company billing shipments through from starting point to destination on its own bills.

Seaboard Co-ordinates Service with Independent

The Seaboard Air Line has recently entered an agreement with the Florida Motor Lines, independent motor coach operating company, for the co-ordination of the latter's motor coach service between St. Petersburg and Tampa and West Lake Wales, Florida, with the train schedules of the Seaboard's "Fast Mail" to and from points between West Lake Wales and Miami.

According to the arrangements all railway tickets issued by the Seaboard between stations served by the motor coaches, or to points beyond served by the Seaboard trains will be honored on

Truck-Boat Freight Facilities of the New Haven at Providence, R. I.

the Florida Motor Lines coaches. Seaboard agents, however, will not sell tickets issued by the Florida Motor Lines for local points served by the motor coaches. Hand baggage will be handled on the motor coaches without extra charge but trunks and other luggage will be forwarded on regular Seaboard trains when the motor coach passenger holds a Seaboard ticket. This arrangement became effective on December 20.

D. & R. G. W. Plans New Line

The Denver & Rio Grande Western is reported to be contemplating the operation of motor coaches from Alamosa, Colo., to Santa Fe, N. M., paralleling its narrow-gage line between those points. It is understood that the possibility of operation of this line hinges upon the completion of proposed improvements to the highway between Alamosa and Santa Fe. The projected line would be an extension of the Denver & Rio Grande Western's present motor coach system, the southern terminus of which is now at Alamosa.

Southwestern Acquires New Certificate

The Southwestern Transportation Company, motor coach and truck operating subsidiary of the St. Louis Southwestern has acquired the permit of the J. E. Thompson Motor Express Company, covering the operation of motor coaches and trucks for freight and passengers between Little Rock, Ark., Stuttgart and Gillett. In return, the Southwestern Transportation Company has transferred to the Thompson Motor Express Company its permit for operation between Little Rock and Hot Springs.

According to the president of the Thompson Express Company, J. E. Thompson, no cash consideration was involved in the transfer, the exchange having been made as a result of the desire on the part of the Southwestern Transportation Company to confine its motor operations to the territory traversed by the Cotton Belt railway lines.

Propose Transfer of Oregon Certificates

The Southern Pacific Motor Transport Company, the Calistoga & Clear Lake Stage Company, and the Golden Gate Stages have applied to the Oregon Railroad Commission for permission to transfer their operating certificates covering parts of the territory between the Oregon-California state line and Portland, Ore., to the Pickwick Stages System. These applications are in consequence of the merger of the interests of the Southern Pacific Motor Transport Company, and the principal independent lines in Southern Pacific territory, whereby all these companies are placed in the control of a holding company, Pacific Transportation Securities, Inc.

To Press for Motor Transport Regulation

James S. Parker, chairman of the House committee on interstate and foreign commerce, following a conference with President Hoover on the subject of proposed legislation for the regulation of motor vehicle transportation, announced that he intended to press for the passage of a bill at this session of Congress and that the matter would be taken up by the committee on January 8. Chairman Couzens, of the Senate committee on interstate commerce, has been authorized to appoint a sub-committee to deal with bills on the subject and probably to hold hearings.

S. P. Affiliates Granted New Certificates

The Pickwick Stages System and the California Transit Company, two of the previously independent companies with which the Southern Pacific Motor Transport Company is now affiliated, have been granted authority by the California Railroad Commission to operate passenger, baggage and express service by motor coach between San Francisco, Cal., and the California-Oregon state line. The Pickwick Stages System has applied to the commission for a blanket certificate covering all routes operated by the company and by companies which it has absorbed throughout the state of California.

Missouri Pacific Buys More Lines

The Missouri Pacific Transportation Company has purchased the Cardinal Stage Lines, operating between Topeka, Kan., and Atchison, and between Kansas City, Mo., St. Joseph, Leavenworth, Kan., Atchison and Hiawatha. The Missouri Pacific Transportation Company has also acquired the Thornton Motor Coach Lines, operating between New Orleans, La., and Buras. Acquisition of these lines brings the motor coach route mileage of the Missouri Pacific Transportation Company up to a total of more than 4,000.

Railways in 1929 Ordered 1,764 Trucks, 390 Motor Coaches

Steam railways together with their subsidiary and affiliated highway operating companies, ordered 1,764 motor trucks and 390 motor coaches during 1929, according to statistics of these purchases compiled by the *Railway Age* for publication in its annual statistical number to be issued January 4, 1930. This compilation further reveals that the railways and their affiliated companies also placed orders during the past year for 92 passenger automobiles, 59 tractors and 31 trailers.

As the *Railway Age* will point out in its discussion of the foregoing figures, the statistics on railway purchases of highway vehicles continue somewhat fragmentary. Despite this fact, however, the comparison with 1928 purchases shows a marked upturn in railway orders for 1929. The *Railway Age* of January 5, 1929 reported purchases of 227 motor coaches, 68 trucks and 51 passenger automobiles for the year 1928. It will be noted that the largest increase during the past year is in the freight vehicle figure. This is due mainly to the inclusion for the first time of orders placed by the Railway Express Agency. In prior years this latter was a separate company but is now a wholly-owned joint enterprise of the steam railways.

Tractor and Trailer in Rock Island Freight Service

But even though the orders of the Railway Express Agency be disregarded the comparison, nevertheless, still remains most favorable to 1929. The Express Agency placed orders for 1,517 of the 1,764 trucks and 43 of the 59 tractors listed. This leaves a total of 247 trucks and 16 tractors ordered by others. To these should be added the 31 trailers purchased to bring the total highway freight vehicles purchased during 1929 by railway interests, other than the Express Agency, to 294. The 294 then is properly compared with the orders for 68 trucks reported in 1928.

In the article entitled "Motor Transport Looms Larger in Railway Picture" the above mentioned annual statistical number of *Railway Age* will tabulate the growth of railway motor coach and motor truck operations. This tabulation will reveal that since 1925 the number of railways operating motor coaches has grown from 10 to 78 while at the same time the number of vehicles in these services has risen from 300 to 2,389. During the same period the number of truck operating railways has increased from 15 to 55 while the number of motor trucks, tractors and trailers in these highway freight services rose from 900 to 5,900.

Orders for Equipment

THE UNION PACIFIC STAGES has accepted delivery on 10 Mack Model BK six-cylinder motor coach chassis.

THE UNION PACIFIC SYSTEM, Omaha, Neb., has accepted delivery of two 29-passenger Model P-30 ACF parlor motor coaches.

THE BALTIMORE & OHIO has accepted delivery of three 18-passenger ACF parlor motor coaches

THE UNION PACIFIC RAILROAD COMPANY, Portland, Ore., has accepted delivery of two 25-passenger ACF parlor motor coaches.

THE BURLINGTON TRANSPORTATION COMPANY, subsidiary of the Chicago, Burlington & Quincy, has received three Type W observation coaches from the General Motors Truck Company.

THE BURLINGTON TRANSPORTATION COMPANY has accepted delivery of a Model 65 six-cylinder motor coach from the White Company, Cleveland, O.

THE INTERSTATE TRANSIT LINES, subsidiary of the Union Pacific, has accepted delivery of 14 Model 54 motor coaches from the White Company.

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY has accepted delivery on a six-cylinder parlor type Fageol motor coach.

THE UNION PACIFIC STAGES, INC., has accepted delivery of ten Model BK 6-cylinder motor coach chassis from Mack Trucks, Inc.

THE INTERSTATE TRANSIT LINES, subsidiary of the Union Pacific, has accepted delivery of one type W observation coach from the General Motors Truck Company, Pontiac, Mich.

THE WESTERN SLOPE MOTOR WAY, INC., subsidiary of the Denver & Rio Grande Western, has received one Type W observation coach from the General Motors Truck Company.

THE SOUTHWESTERN TRANSPORTATION COMPANY, subsidiary of the St. Louis Southwestern, has accepted delivery of three 6-cylinder motor coaches from the White Company.

THE GEORGIA HIGHWAY TRANSPORT COMPANY, subsidiary of the Atlanta & West Point, has received one Model 54 and one Model 65 motor coach from the White Company.

THE COPPER RANGE MOTOR BUS COMPANY, subsidiary of the Copper Range, has accepted delivery of a Model 65 six-cylinder motor coach from the White Company.

THE DENVER-COLORADO SPRINGS-PUEBLO MOTOR WAY, INC., subsidiary of the Denver & Rio Grande Western and the Denver & Interurban, has accepted delivery of a Model BK 6-cylinder motor coach chassis from Mack Trucks, Inc.

Motor Transport Officers

F. H. Sullivan has been appointed general auditor of the Greyhound Lines, with which the Pennsylvania is affiliated. His headquarters will be at Chicago.

T. Finkbohner has been appointed special representative of Pacific Transportation Securities, Inc., with headquarters at San Francisco, Cal.

H. R. Leigh, superintendent of the North Coast Transportation Company, has resigned to become general superintendent of the Union Pacific Stages, with headquarters at Portland, Ore.

F. W. Garretson has been appointed assistant auditor of the Pickwick Stages System, the California Parlor Car Tours Company and the Union Auto Transportation Company, with headquarters at Los Angeles, Cal.

C. L. Bangs has been appointed auditor of the Oregon Stages, Inc., with headquarters at Portland, Ore., succeeding **F. W. Garretson,** transferred. **E. W. Hopkins** has been appointed assistant auditor, with headquarters at the same point, succeeding Mr. Bangs.

James G. Hofgaard, superintendent of maintenance of the Blue and Grey Transit Company, Charleston, W. Va., has resigned to take charge of the maintenance of equipment of the Burlington Transportation Company, with headquarters at Omaha, Neb.

R. R. Wilson has been appointed superintendent of operation of the Union Auto Transportation Company and the Pickwick Stages System, with headquarters at Phoenix, Ariz., succeeding **Earl Standage,** who has been transferred to the territory covering El Centro, Cal., to and including Safford and Douglas, Ariz.

H. W. Stewart, president and general manager of the Cannonball Motor Transportation Company, which was recently acquired by the Burlington Transportation Company, subsidiary of the Chicago, Burlington & Quincy, has been appointed assistant manager of the Burlington Transportation Company's operations in Illinois, with headquarters at Monmouth, Ill.

C. E. Quigley has been appointed auditor of the Southern Pacific Motor Transport Company, the California Parlor Car Tours Company, Union Auto Transportation Company, California Transit Company, Pickwick Stages System and the Pacific Transportation Securities, Inc., with headquarters at San Francisco. Mr. Quigley succeeds **F. W. Ackerman,** resigned.

Among the Manufacturers

The White Company has recently completed a branch building at Newark, N. J. This new building involves an expenditure of $500,000 and contains 55,000 sq. ft. of floor space.

Thomas A Aspell, assistant tire sales manager, automotive division, of the B. F. Goodrich Rubber Company, Akron, O., has been promoted to general manager of tire sales, succeeding **Harry Miller,** deceased.

The LaFrance-Republic Sales Corporation has opened a factory branch in Newark, N. J. with headquarters at Frelinghuysen avenue and Hunter street. **Roscoe C. Allen,** who has been in charge of the company's affairs at Newark, will continue as manager of the new branch.

J. W. McKinley and **F. W. Goodes** have joined the field staff of the La-France-Republic Sales Corporation. Mr. McKinley has been assigned the territory comprising Indiana, Illinois, and part of Iowa, Missouri and Wisconsin. He succeeds **John W. Hansen** who resigned because of ill health. Mr. Goodes will have charge of sales work in Kansas, Nebraska, Colorado, Texas, Arkansas and part of Iowa.

George D. Wilcox, advertising manager of the Federal Motor Truck Company, Detroit, has been appointed merchandising manager in charge of the newly created merchandising department. This new department will work with Federal branches, distributors and dealers for the improvement of selling methods and business management. Mr. Wilcox will continue also to supervise the advertising department.